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A PLEA FOR A MORE CONSERVATIVE ATTITUDE IN RENAL SURGERY

Chairman's Address

ARBOR D. MUNGER, M.D.
Lincoln, Neb.

Just as in theology one has a conception of "original sin," so for the most part clinical observation impresses one that in the surgical treatment of diseases of the kidney the fetish for nephrectomy comes near to being the surgical "original sin." Renal pathology of sufficient moment to necessitate surgical interference presupposes organic or functional disturbance of such degree that the life of the patient or the integrity of the kidney or both are jeopardized. Recovery can be achieved in these cases by operative intervention. It is, however, unfortunate that this relief is obtained most frequently at the expense of extirpation of the kidney. To the urologist must go credit for the more comprehensive understanding of renal physiology, of anatomy and of the genesis of renal pathology—organic and functional. And yet it may safely be said that the surgeon who is doing renal surgery too often fails to make use of this new knowledge when its application favors a more conservative procedure.

The wide variety of lesions which one finds suitable for the newer methods of plastic technics or partial nephrectomy are legion. But, likewise, they challenge the judgment and technical ingenuity of the surgeon. Hydronephrosis is the commonest form of renal disease. Bell [1] has reported, exclusive of hydronephrosis due to renal calculi, an incidence of 3.8 per cent among 32,360 postmortem mechanical obstructions of an organic nature, namely: carcinoma of the prostate, bladder, uterus, ovary and rectum, with prostatic hypertrophy, uterine tumors and pregnancy as responsible agents for this high frequency and with only a small group of the congenital type.

It is toward this group of cases that a more universally conservative attitude is greatly to be desired. As Sargent [2] has aptly stated: "Witness, if you will, the fact that all general surgeons and a very large share of urologists themselves still confine their effort in the management of cases of ureteropelvic obstruction to two procedures—diagnosis and then nephrectomy." Let it not be assumed that nephrectomy is not necessary at times; it goes without saying that it is. But increasingly improved technics, the combination of plastic correction with partial nephrectomy and an understanding of renal physiopathology reduce to a minimum the necessity for nephrectomy.

Let me present some of these principles which serve to argue so well for conservative surgery. In the first place not all hydronephroses need surgical intervention. Pelvic dilatations of a fixed nature which produce no symptoms and in which the renal function remains unimpaired need no immediate operation. Reexamination every six to twelve months should be performed until one is satisfied that the condition is not progressive. The criteria necessary to make a choice between conservative surgical intervention and nephrectomy are, I believe, well delineated. One must consider (1) the functional value of the involved kidney, (2) whether the condition is bilateral or unilateral and (3) the presence and severity of infection. The factor of function in a kidney is of much more value than the size of the pelvic dilatation. If the clinician were to rest on the described pathologic changes which occur as the result of chronically increased intrapelvic pressure, then corrective plastic procedures would have but little place. On the contrary, clinically, it is astounding to see the great functional recovery, both tubular and glomerular, that a hydronephrotic kidney of this type will evidence.

In greatly dilated renal pelves containing a large amount of residual urine the usual functional dye tests are, as a rule, useless in the estimation of excretory integrity. It is here that an excretory urogram is of inestimable service. Early films show only a little puddling in the calices, but definitely increased density develops in the residual urine in one and two-hour films, to establishing the existence of a worthy degree of function.

I am not in sympathy with the oft expressed principle that a hydronephrotic kidney, if operated on at all, should be removed unless it is capable of carrying the total function in the event that the opposite kidney should be removed. Dodson [3] in his most recent book has stated that "Nephrectomy is usually indicated in large unilateral hydronephrosis with diminished renal function and a healthy compensating mate." This is a most depressing theory and lacks a basis in clinical fact, but certainly this statement in the mind of the general surgeon establishes an authoritative basis for nephrectomy.

Nor can a proper evaluation in regard to ultimate functional recovery be established by an indwelling ureteral catheter. Drainage established by a well instituted pyeloplasty will be the ultimate criterion to functional recovery. Rather than continue in a retarded state the reestablished kidney will extend itself to recover reasonable function.

Read before the Section on Urology at the Ninety-Fifth Annual Session of the American Medical Association, San Francisco, July 4, 1946.

1. Bell, E. T.: Renal Diseases, Philadelphia, Lea & Febiger, 1945.
2. Sargent, J. C.: J. Urol. **47**: 323, 1942.
3. Dodson, A. I.: Urological Surgery, St. Louis, C. V. Mosby Company, 1945.

CASE 1.—Mrs. C., a woman aged 26, the wife of a soldier, came into my office with a decidedly generalized edema; the level of blood urea nitrogen was 127 mg. per hundred cubic centimeters; the blood pressure was 182 systolic and 80 diastolic. She was persistently nauseated, had violent headaches and progressive oliguria and was seven months pregnant. A history obtained from the husband and the patient revealed that a diagnosis of infected bilateral hydronephrosis with right renal calculus had been made one year previous in an army hospital. On the third attempt at corrective surgical intervention to the left kidney, ostensibly her better kidney, a nephrectomy had been performed in this army hospital. The infected right hydronephrosis with calculus was not corrected. As her pregnancy progressed the local and systemic manifestations from the pathologic condition in the residual kidney deepened until she appeared at my office with the symptoms detailed herein. She was immediately hospitalized, and a rapid pyelostomy was performed without attempting to remove the large calculus impacted in the ureteropelvic juncture. With the institution of proper intrarenal drainage and acceptable rehabilitative measures, this long standing, badly damaged and infected hydronephrosis made a remarkable functional recovery, and the patient assumed a normal clinical status except for a nonviable fetus which the consulting obstetrician relieved by cesarean section without incident to the patient. Several weeks later the right kidney was reapproached for corrective surgical intervention. The calculus was removed; part of the thickened redundant renal pelvis was resected away, and a sharply angulated, minutely calibered rigid stricture at the ureteropelvic juncture was split longitudinally and inlaid with a size 14 F gallbladder T tube, one end into the kidney pelvis and the other into the ureter. No attempt was made to cover the T tube in the strictured area, only tacking sutures to stabilize the tube in place. The kidney pelvis wound closed, and further pelvic or nephrostomy drainage was not instituted. On the twenty-eighth day the gallbladder T tube was removed and no leakage whatsoever occurred from the drainage tract. For the past four months this newly reformed ureteral area is being regularly calibrated with no. 9 bulbs and zealous apprehension. The patient maintains an infected urine of varying degree, a minimal residual urine, a blood urea nitrogen level within normal range, a satisfactory kidney function and absent local hydronephrotic symptoms. Clearly this kidney has emerged from a precarious chronic pathologic existence and is extending itself to carry on a normal physiologic career.

Congenital obstructive anomalies of the upper portion of the urinary tract tend to be bilateral. True it is, in most instances, that predominating symptoms and urologic observations present themselves in one kidney and the physician is prone to assume the obvious. However, a more minutely critical survey will reveal a bilaterality not indicated by the clinical symptoms. Thus, the removal of the manifestly hydronephrotic kidney in this circumstance throws an irreparable burden on the remaining member. There is an old saying that nephrectomy in the thirties for hydronephrosis leads to a hydronephrosis in the forties on the opposite side. To consider how this comes about, the manifestly hydronephrotic kidney, for example, may maintain a daily urinary output of 1,000 cc., whereas the ostensibly normal kidney maintains a daily excretion of 1,500 cc. Remove the damaged kidney, and the undamaged kidney, in order to maintain proper physiologic balance, attempts to assume the work of its removed mate and to excrete 2,500 cc. a day. Under this extra volume, an abnormal intrapelvic pressure builds up and starts pelvic expansion. However slight and unembarrassing is the obstructive process heretofore existing, it now becomes a matter of grave pathologic importance. A static urine of duration is invariably an infected urine. And it is safe to assume that all hydronephroses are infected lesions. The infection on urologic survey may not be palpably evident; however, once plastic surgery is undertaken active infection usually manifests itself. A careful cultural study is of the utmost importance. What with the proper application of the newer chemotherapeutic and antibiotic agents to augment the selected technical procedure along with the most essential principle of adequate and sufficiently prolonged drainage and of splinting where it is indicated, successful end results may be expected.

In only an occasional case will one be rewarded by disappearance of the infection. The restoration of adequate drainage, however, does lessen the residual urine and decrease the persistence of the invading organism. Slight residual pyuria or other sequelae are less disastrous than the destruction of function. I do not propose any individual successful pyeloplastic operation. The wide variety of plastic procedures applicable to this condition suggests that no single pattern holds advantage over another except as it may be especially applicable to the correction of the condition at hand.

The procedure of choice depends on the cause of the obstruction, which can be definitely determined only at operation. The ureteropelvic outlet may be distorted by extensive adhesions, fibrous or vascular bands and anomalous vessels. The juncture may be blocked by stricture, cysts, hypertrophied muscle or valve formation because of high insertion of the ureter. The plastic procedure that will correct the particular condition discovered should be chosen.

Except in far advanced cases, hydronephrosis due to obstruction at the ureteropelvic junction may be corrected by pyeloplasty, but the decision between pyeloplasty and nephrectomy is sometimes difficult to make unless severe infection is present or the pyelogram and appearance of the kidney at operation indicate the need for nephrectomy. If the obstructive lesion is extrinsic, pyeloureterolysis usually eradicates the obstruction. The presence and extent of intrinsic block is determined by probing the junction through a small incision, with a hemostat or a no. 12 or 14 F bougie. The caliber of the lumen should be measured and the degree of angulation noted. When stricture is encountered, the jaws of the hemostat are gradually spread to open the lumen while an incision is made to split the stricture throughout its length. The gap is bridged with a no. 12 or 14 ordinary gallbladder T tube left in place for three weeks. Epithelization around the tube ends will have occurred to form a new ureter.

When a hypertrophied muscle is encountered a row of parallel incisions are made down to the mucosa. Splinting and intubation are done through an incision below the hypertrophied muscle area with a no. 14 F tube to maintain the caliber of the lumen until healing is complete.

Obstruction from valve formation due to high insertion of the ureter into the pelvis is corrected by a suitable pyeloplastic operation, and the cut edges of the pelvis may be excised. An excessively redundant pelvis may be resected, and the ureter joined to the lowest part of the remaining pouch. Ureteral implantations or lateral anastomoses may also be utilized.

Anomalous veins may be sacrificed, but arteries should be treated with circumspection. The aberrant blood vessels to the lower pole of the kidneys are saved by a pyeloplasty by which the anterior and posterior walls of the pelvis are partially excised in such a way that, when sewed together, the ureter is in correct alinement. Nephropexy is performed as indicated.

Occasionally a renal sympathectomy is desirable to assure relief of pain.

Ureteral splinting and intubation, the most important single factor in the success of pyeloplasty, should be performed around the pelvis or ureter by any of the various methods suitable to the particular case. Splinting and intubation should be maintained for at least ten days to three weeks, or longer if necessary. The best adjunct to use for combined draining and splinting purposes is the ordinary gallbladder T tube.

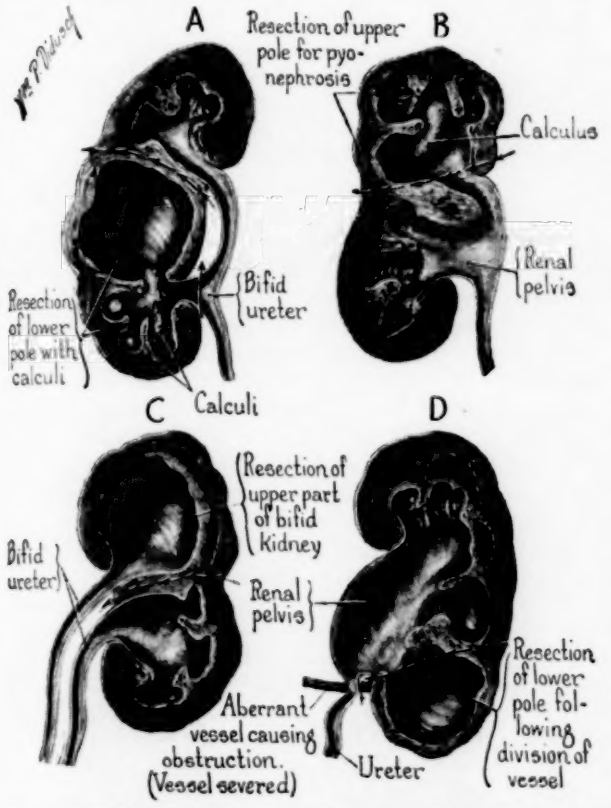

Fig. 1.—Partial nephrectomy for *A* (case 2), calculous pyonephrosis; *B* and *C*, lithiasis, and *D*, abnormal blood vessels with resultant pyelorenal ectasis.

Lesions of the kidney, which so frequently eventuate in nephrectomy, are in a surprising number of instances small lesions localized to a definite area of the organ with the rest of the parenchyma perfectly sound and the pyeloureteral excretory system corresponding to the same area perfectly intact. Nephrectomy frequently entails excessive mutilation and certainly often sacrifices the much needed healthy parenchyma surrounding a single and restricted lesion. In view of the vital importance of renal function, a more conservative method is essential. Partial nephrectomy has been in use since 1887 when Czerny first employed the method eighteen years after Simon had performed the first total nephrectomy. At that time an exact exploratory technic was not available. At present it is possible by urographic and other functional examination to determine more or less accurately the portion of the kidney which is affected, the cause of the lesion and the condition of the remainder of the organ, especially of the pyeloureteral excretory passage; therefore, conservative intervention can be carried out if the location of the lesion permits. Prior to surgical intervention, translumbar aortography (according to the technic of Reynaldo dos Santos [4]) may afford an exact knowledge of the morphology of the renal blood vessels, the condition of the portion to be saved and the location of the lesion to be resected. This is especially important if only one kidney remains or the contralateral kidney is diseased.

Indispensable prerequisites to partial nephrectomy are a normal blood supply to the portion of the organ which is to be saved and the absence of obstruction, assuring permeability of the excretory passages of this residual portion. The anatomic integrity of this portion must be previously ascertained and then verified at operation by manual examination and, if necessary, by direct roentgenography. Unless these conditions are satisfactory the resection should not be undertaken except in emergencies.

A study of extirpated kidneys with small, circumscribed lesions indicates that in many cases it is possible to remove the damaged portion without interfering with the function of the healthy residual portion. Conservation of one quarter of the total renal mass, or one half of one kidney, is sufficient and compatible with life.

Case 2.—Mr. C. S., a man aged 48, physically well set up, had a left nephroureterectomy for renal tuberculosis in 1939. At the time of his nephrectomy he had a known moderate nonspecific infection in the upper part of the urinary tract on the right side. Likewise, there was a bifid kidney on the same side. Under increased functional stress during the following year there developed multiple calculi with increasing pyelectasis in the lower pelvis of the residual kidney. Progressively severe local and systemic symptoms made it necessary to interfere surgically. On inspection, the upper half of the kidney, the ureter and blood supply appeared normal. The lower half of the kidney was soft, distended and bluish—definitely a case of calculous pyonephrosis. This pyonephrotic lower half with its ureter to the bifurcation was amputated through a rather bloodless suggestion of a septum. This residual portion of the right kidney has been sufficient to enable the patient to live normally for nearly six years with manifestly fewer signs of renal insufficiency than existed before the partial nephrectomy (fig. 1 *A*).

As a rule, it is possible only at operation to determine whether or not partial resection is possible, although pyelography is also of great value. Partial nephrectomy is indicated in all cases in which the lesion affects less than one half of the organ; in exceptional cases smaller portions may be saved. The method is especially indicated in partial or localized hydronephrosis affecting the parenchyma of one or two calices or one polar extremity of the organ. If the operation is supplemented by proper pyeloureteral correction to assure subsequent drainage of the residual portion, the results are certain. In lithiasis affecting a large zone, in which simple extraction of the calculus is not sufficient, partial nephrectomy will permit conservation of the remainder of the parenchyma and prevent progress of the lesion due to contact of the healthy tissue with the inflammatory process (fig. 1 *B*, *C*; fig. 2). In renal cysts partial nephrectomy is indicated if the cysts are restricted to one

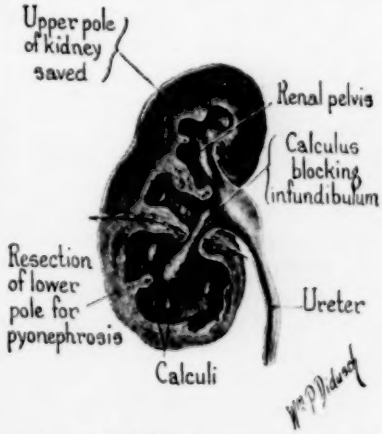

Fig. 2.—Partial nephrectomy in case of lithiasis.

4. dos Santos, R.: Med. contemp. **47**: 93, 1929.

zone; this is frequently the case with large solitary cysts. Partial resection is indicated in some cases of hydatid cyst, provided the cyst can be removed with the affected portion and communication does not exist between the cyst and the calices or renal pelvis (fig. 3 *B*).

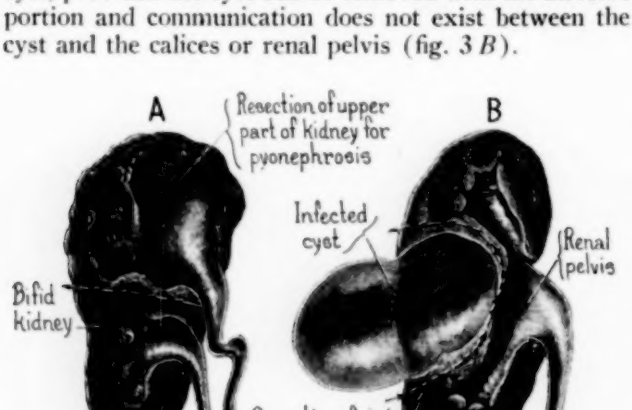

Fig. 3.—Partial resection in cases of localized destructive renal infection (*A*, *C* and *D*) and hydatid cyst (*B*).

Partial resection is indicated when it is necessary to remove abnormal blood vessels which alter or impede pyeloureteral evacuation, with resultant permanent or temporary pyelorenal ectasis. If the renal area supplied by this vessel is greatly changed (atrophic, infected) the superimposition of circulatory disturbances inherent in the ischemia produced by section of the vessel may easily lead to septic necrobiosis of that zone, and the septic process may extend to other renal areas. In these cases it is advisable to extirpate the portion affected by the ischemia in order to avoid this danger and save the remainder of the organ. In certain plastic pyeloureteral interventions it may be necessary to extirpate a portion of the kidney (fig. 1 *D*).

In destructive renal infection localized in one restricted portion of the organ, extirpation of this zone and direct drainage through the surface may save a considerable portion of the kidney. This has been found effective in abscesses of the renal cortex, renal infarction, localized pyonephrosis and perirenal abscesses invading the organ by contiguity (fig. 3 *A*, *C* and *D*).

It is conceivable that partial nephrectomy may be employed in renal tuberculosis, especially if there is coincident complete pyeloureteral duplication, permitting functional and roentgenographic examination of each excretory system independently. If careful functional tests (and especially retrograde pyelography) indicate that one portion of the duplicated kidney is completely intact, and if at operation the vascular condition and the degree of extension of the infection will permit it, extirpation of the tuberculous duplication would be indicated.

In pyelic and pyeloureteral anomalies with infection involving only one portion of the kidney, and in which the remaining excretory system is adequate for the accumulation of the urine secreted by the healthy kidney, partial nephrectomy is indicated (fig. 4). Authorities are not in accord as to the value of partial nephrectomy in renal neoplasm. Favorable results have been reported in benign and restricted cases. Czerny performed the operation in a case of angiosarcoma of the kidney. Renal fracture offers a most satisfying field for the exercise of conservative judgment. Almost irrespective of how badly shattered is the renal parenchyma with an intact renal pedicle, and even though it is of a number of days' duration, with a large retroperitoneal accumulation of blood and urine, infected or not, after the gathering together of the fragments in some semblance of a mass, protected by gauze pack and wide open drainage, the kidney will astoundingly recover and will reestablish a satisfactory pyeloureteral excretory system.

In all cases the surgical indications depend on the anatomic condition of the organ and the lesion and on the condition of the contralateral kidney. I consider that it is preferable to risk failure of conservative treatment, necessitating intervention, rather than to

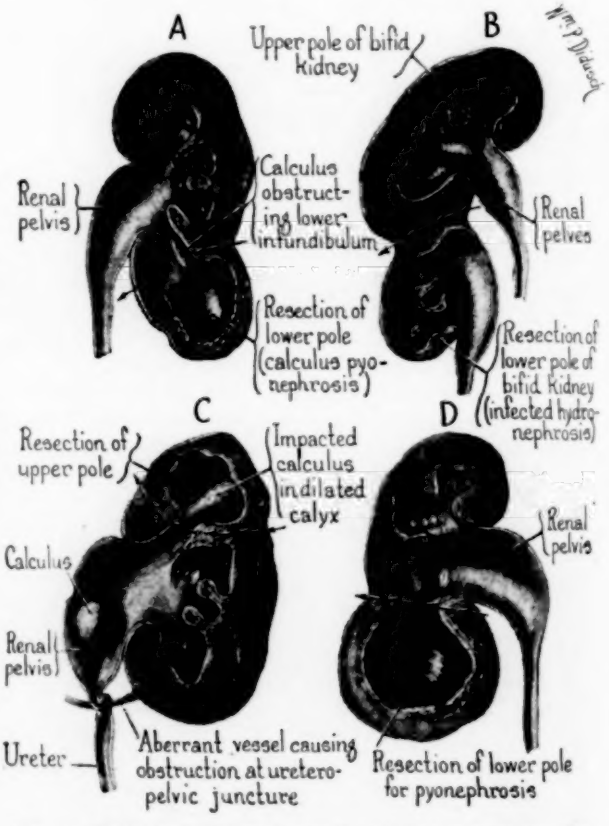

Fig. 4.—Partial nephrectomy in pyelic and pyeloureteral anomalies.

remove a kidney which might have been saved in whole or in part. One disadvantage of the partial resection which has prevented more extensive adoption of the method is hemorrhage of the sectioned surface, together with the difficulty of obtaining hemostasis. Systematic use of the electric bistoury for section of the renal

parenchyma reduces the severity of this immediate complication. Another disadvantage, hitherto, has been the difficulty of determining the exact zone affected by the lesion. However, modern exploratory and roentgenographic methods render localization of the lesion and confirmation of the integrity of the remaining renal area possible prior to or during operation.

Two fundamental technical details must be observed in partial nephrectomy: (1) previous ligation of the prehilar vascular system of the portion to be extirpated and (2) suture of the bleeding surface of the kidney, supplemented by the application of a muscle tissue graft, thrombin topical and desiccated fibrin film over the bleeding area to afford better hemostasis. The graft may be obtained from the margin of the lumbar operative incision. The muscle tissue reinforces the sutures in the friable tissue of the renal parenchyma. The institution of drainage is decidedly important and may determine the success of the intervention. If the excretory passages, renal pelvis or calices have been opened and are closed by suture, intrarenal drainage is essential and should be continued for from fifteen to twenty days until perfect coaptation of the pyelorenal suture is assured. Drainage removes the danger of urinary fistula, which might interfere with the ultimate conservative results. Perirenal drainage near the bleeding surface should never be omitted. It should be maintained for at least eight days to prevent the retention of any suppurative material. Lack of communication with the external surface favors abscess formation, with possible extension of the infection to the other parts of the kidney.

SUMMARY

1. There are too many nephrectomies.

2. The surgical correction of hydronephrosis is for the most part a perfectly logical and feasible operation.

3. Hydronephrosis is commonly a bilateral disease.

4. Protective splinting with adequate and prolonged intrapelvic drainage is an absolutely necessary procedure in plastic correction of the renal pelvis.

5. About 70 per cent of diseases requiring surgical intervention and of congenital malformation of the kidney are amenable to partial nephrectomy.

6. Total nephrectomy in hydronephrosis should be instituted only when it can be demonstrated that the drainage system is completely destroyed beyond recovery and in renal disease wherein it can be shown that the kidney is utterly worthless.

1015 Sharp Building.

Birthday of Atomic Energy.—Major Gen. L. R. Groves, commanding general of the Manhattan project, said that the significant anniversary which should be observed in connection with the United States program of development of atomic energy is December 2. It was Dec. 2, 1942 when the first successful nuclear reactor was made to work. It was built under the West Stands of Stagg Field at Chicago by a group of scientists working under Arthur H. Compton at the Manhattan project's metallurgical laboratory. That was the day on which man first demonstrated that not only could he release the energy of the atom but he could control it. A special meeting of representatives of the Argonne National Laboratory and its twenty-five participating universities will be held in Chicago on December 2, the fourth anniversary of the first self-sustaining pile.

NEUROLOGIC COMPLICATIONS OF SPINAL ANESTHESIA

MORRIS J. NICHOLSON, M.D.
and
URBAN H. EVERSOLE, M.D.
Boston

Neurologic complications, although infrequent, may follow spinal or general anesthesia. There are reports in the literature of cranial nerve palsies,[1] hemiplegia [2] and peripheral neuropathies [2a] following general as well as spinal anesthesia. Certain neurologic complications are prone to follow spinal anesthesia while others are more frequent after general anesthesia. Woltman found that convulsions, extrapyramidal rigidity and postoperative psychosis followed general anesthesia almost exclusively.[2a] Courville has shown that the anoxic hypoxia associated with the administration of such weak anesthetic agents as nitrous oxide and ethylene can cause degenerative changes in the cerebral cortex and lenticular nucleus.[3] On the other hand, headache,[2] septic [4] and aseptic meningitis,[5] arachnoiditis,[6] neuritis,[7] myelitis [8] and the cauda equina syndrome [9] have been the complications most frequently reported following spinal anesthesia. It is on these complications, particularly the cauda equina syndrome, that our attention will be centered.

These cauda equina complications are generally brought to the anesthesiologist's attention because the patient fails to regain the use of his lower extremities at the usual time following spinal anesthesia. On examination, loss of motor and sensory function is generally found to involve the lumbosacral nerve distribution. Associated observations are urinary retention and incontinence of feces with the loss of anal sphincter tone. This loss of bowel and bladder function is the most ominous part of the entire clinical picture, and the return of function, when it occurs, is extremely

From the Department of Anesthesiology, the Lahey Clinic.

Read before the joint meeting of the Section on Orthopedic Surgery and the Section on Anesthesiology at the Ninety-Fifth Annual Session of the American Medical Association, San Francisco, July 5, 1946.

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slow. Impairment of sensation seems to be exceedingly variable. This loss of sensation may involve only the saddle area, one or both legs or the entire body below the umbilicus. Ferguson and Watkins[9b] felt that it was clear from the examination of all their patients that the basic lesion was the same (cauda equina) but the variations were due to different degrees of affection of this area.

ETIOLOGY

The exact cause of each of the neurologic complications that have been reported following spinal anesthesia in man is difficult to determine. Several investigators have shown that certain spinal anesthetic drugs cause a specific toxic destructive effect on nerve tissue when they are injected intrathecally in the dog or cat. Davis and his associates,[10] after injecting dibucaine (Nupercaine hydrochloride), a solution of procaine, amyloprolamine, alcohol and strychnine sulfate (Spinocain), a solution of procaine 40 per cent containing a small amount of strychnine (Gravocain) and procaine hydrochloride (Scurocaine) intrathecally in dogs, observed the following changes: (1) a varying degree of inflammatory reaction in the leptomeninges; (2) passive changes in the ganglion cells of the gray matter of the cord similar to those seen in retrograde or so-called wallerian degeneration; (3) swelling and fragmentation of axis cylinders, and (4) signs of degenerative changes in the fiber tracts of the cord. Lundy[11] was able to show degenerative changes in the nervous structure in dogs when they were exposed to 20 per cent concentrations of procaine hydrochloride but was unable to show the same degenerative phenomena when the concentration was less than 17.5 per cent. MacDonald and Watkins,[12] in an attempt to explain the damage to the cauda equina caused by heavy Durocaine[13] in human beings as reported by Ferguson and Watkins,[9b] used cats for their experiments. First, they administered the gliadin, glycerin and alcohol which had been added to the procaine hydrochloride to make the Durocaine to find out what effect these drugs would have on the cauda equina of cats. They were unable to produce paralyses in cats by the intrathecal injection of 15 per cent alcohol with 20 per cent glycerin. In using solutions of the same concentration as that employed in man but of greater relative bulk, however, they were able to reproduce the lesions of the cauda equina with heavy Durocaine in a considerable proportion of the cats. They could also produce such lesions by injection of procaine hydrochloride itself in the same concentration, 10 per cent, as that employed in man. Furthermore, the incidence of these lesions in cats was greatly increased by employing a stronger concentration of the drug. There seems to be little doubt, therefore, that the toxicity lies within the spinal anesthetic agent itself when the cat or dog is the subject.

The clinical manifestations of the lesion of the cauda equina might be explained by damage to the lumbosacral region of the cord, to the conus medullaris or to the nerves of the cauda equina, but it seems more probable that the maximal damage is to the latter. It seems rather evident that the lesion produced is the direct result of the administration of a spinal anesthetic agent, since in most cases it has occurred immediately following the operative procedure. A discussion of several possible ways in which such damage might occur follows.

Direct Trauma.—Direct trauma as the sole cause of the anesthetic complication can fairly well be eliminated because of the tens of thousands of diagnostic lumbar punctures, some of them with much trauma, that have been performed without any similar complication. But there does seem to be a definite relationship between the traumatic spinal puncture, which causes pain to radiate down the leg and which is combined with the injection of a spinal anesthetic drug, and a permanent neurologic complication.

Inflammatory Reaction.—The rapid onset of most of these complications seems to preclude infection as the etiologic factor. Furthermore, no organisms have ever been cultured from the spinal fluid of a patient with this type of lesion, and the dominating cells are generally lymphocytes rather than polymorphonuclear leukocytes. Seldom are there complications associated with an elevation in temperature or other signs and symptoms of an inflammatory process involving the protective coverings of the spinal cord. On exploration of the spinal cord the day after the administration of the spinal anesthetic in case 1, there was slight, if any, evidence of inflammation.

Toxicity of the Drug.—In considering whether these lesions of the cauda equina in man are due to the toxicity of the agent itself, as has been shown to be the case in the dog and cat, it should be noted that not all the nerves influenced by the anesthetic agent are affected by the paralysis. The truth of this observation is clearly illustrated in the reports of cases in which the anesthesia would suffice for an upper abdominal operation and yet the ultimate paralysis would be limited to the lumbosacral or sacral nerves. It seems that only those nerves exposed to the greatest concentration of the drug are affected. Permanent paralysis, then, seems to be greatest in the nerve tissues (nerve roots, conus medullaris and sacral region of the cord) which meet the drug in its full concentration soon after it has left the tip of the spinal puncture needle. The lesion is, therefore, maximal in those roots of the cauda equina into the immediate vicinity of which the drug is injected. The evidence of the experiments on animals leads to the conclusion that this is not in the nature of an idiosyncrasy, as postulated by Brock, Bell and Davison,[8] but that in the concentrations employed most spinal anesthetic drugs have a toxicity little short of that which would produce paralysis in a higher percentage of patients. The cystometric studies of Bellis[14] also showed what a profound effect spinal anesthesia and general anesthesia have on this part of the cord.

Neurologic Disease Precipitated by Spinal Anesthesia.—Another consideration in the etiology of these

10. Davis, L.; Haven, H.; Givens, J. H., and Emmett, J.: Effects of Spinal Anesthetics on the Spinal Cord and Its Membranes: An Experimental Study, J. A. M. A. **97**: 1781-1785 (Dec. 12) 1931.

11. Lundy, J. S.; Essex, H. E., and Kernohan, J. W.: Experiments with Anesthetics: IV. Lesions Produced in the Spinal Cord of Dogs by a Dose of Procaine Hydrochloride Sufficient to Cause Permanent and Fatal Paralysis, J. A. M. A. **101**: 1546-1550 (Nov. 11) 1933.

12. MacDonald, A. D., and Watkins, K. H.: An Experimental Investigation Into the Cause of Paralysis Following Spinal Anaesthesia, Brit. J. Surg. **25**: 879-883, 1938.

13. The composition of Durocaine (heavy) before 1934 was procaine hydrochloride 0.1 g./cc., gliadin 0.00325 g./cc. and glycerin 0.1 g./cc. in 15 per cent alcohol. This was later altered to the following after 1934: procaine hydrochloride 0.1 g./cc., acacia 0.002 g./cc. and glycerin 0.0416 g./cc. in 15 per cent alcohol.

14. Bellis, C. B.: Cystometry, After Spinal Anesthesia, Surgery **16**: 896-905, 1944.

complications is the possibility of spinal anesthesia acting as a precipitating factor in the evolution of certain preexisting neurologic affections. Hammes [15] reported 8 cases in which neurologic complications were associated with spinal anesthesia; 5 involved the following preexisting organic neurologic disorders: pernicious anemia with combined sclerosis, multiple sclerosis, tabes, general paresis and toxic psychosis. Additional evidence that this supposition may be true is gained from cases 2 and 3 in which the patients received spinal anesthesia for the removal of carcinoma of other parts of the body, only to have the anesthesia fail to wear off. Subsequent investigation revealed that the carcinoma had already metastasized and was producing an almost complete blockage of the circulation of the cerebrospinal fluid. That the routine diagnosis of such impending blockage of the cerebrospinal fluid is difficult has been pointed out by Poppen and Hurxthal [16] in their attempt to explain why some patients with known tumors of the spinal cord have normal spinal fluid dynamics. They feel that in spite of the presence of pathologic change, the spinal fluid dynamics will be normal until the opening in the subarachnoid space becomes smaller than the opening in the spinal puncture needle used in the determination.

INCIDENCE

It is almost impossible to determine from the literature the true incidence of neurologic complications following spinal anesthesia, since the reports show a great variation. Early in his experience with spinal anesthesia Babcock [17] reported several abducens palsies, but subsequent to this early experience he reported the administration of 15,000 Stovaine (the hydrochloride of benzoyl dimethylaminoethyl-propanol) spinal anesthetics without neurologic complications. Livingstone and her co-workers [5] gave the incidence of aseptic meningitis as 1 in 2,000, while Hyslop [18] found an incidence of 0.5 per cent of sequelae in the central nervous system after spinal anesthesia. Falk [19] reported a 6 per cent incidence of headache with associated stiff neck. Jarman [20] gave the incidence of paralysis as 1 in 1,000, while Emmett [21] after 1,415 and Foss and Schwalm [22] after 3,000 spinal anesthetics observed no neurologic complications. Ferguson and Watkins [9b] reported 14 cauda equina syndromes following the use of heavy Durocaine in 1,000 cases at the Manchester Infirmary in England over a two and a half year period. During the same period there were 1,000 patients who received Stovaine spinal anesthesia, 300 dibucaine, 860 light Durocaine and 650 whose spinal anesthetic agent was not listed. This makes a 1 to 271 incidence of permanent neurologic complications for the entire group, but since all the complications were with heavy Durocaine, the incidence for this drug is 1 to 71.

In a report on 1,381 patients who received Metycaine hydrochloride spinal anesthesia at the Lahey Clinic, Woodbridge [2b] found 4 patients who suffered a transient foot drop. Although the anesthetic was the most likely etiologic factor, trauma from tight bed clothes may have been a contributing factor in these cases. Fortunately, all 4 of these lesions cleared up completely in six months.

According to Woltman,[23] the ulnar and peroneal nerves are the most frequent sites of peripheral nerve paralyses. He was of the opinion that senility, arterioscleroses, infectious neuritis and trauma must be considered as important factors in the etiology of these neuropathies. Trauma may result from faulty position on the operating table or from the patient's crossing his legs. The latter is especially important when there has been decided loss of weight from a prolonged illness or a serious operation.

There have been 21,000 patients at the Lahey Clinic who have received tetracaine (Pontocaine) hydrochloride for spinal anesthesia since 1934. Five neurologic complications have resulted. In 3 of these patients there developed lesions of the cauda equina type; 2 of the patients were later found to have a cerebrospinal fluid block from metastatic carcinoma. Two developed a peroneal neuropathy which was manifested by foot drop. In addition, 2 patients in whom there developed postspinal neurologic disturbances and who were suspected of having permanent sequelae were found on further investigation and operation to have been suffering from tumors of the spinal cord.

REPORT OF CASES

The following reports of cases in which neurologic complications developed after spinal anesthesia have been obtained from the records of the Departments of Anesthesiology and Neurosurgery of the Lahey Clinic and from the records of certain other anesthesiologists and surgeons outside the Lahey Clinic who have a particular interest in this problem.

Cauda Equina Syndrome

CASE 1.—A white man aged 42, a bartender, was seen Nov. 9, 1943 with the complaint of cold legs of two years' duration and cramps in the calf muscles of six months' duration. A diagnosis of thromboangiitis obliterans was made, and hospitalization for further investigation and a possible lumbar sympathectomy was advocated. On Feb. 26, 1944 he was given 14 mg. of tetracaine (Pontocaine "Niphanoid") hydrochloride and 2.6 cc. of 10 per cent dextrose for skin temperature readings; spinal puncture was made in the third lumbar interspace. Anesthesia developed to the eighth thoracic segment. After twenty hours the anesthesia was still present, and the patient was paralyzed from his waist down. A spinal puncture at that time showed an initial pressure of 50 mm. of water, total protein 347 mg. and sugar 21 mg. per hundred cubic centimeters and lymphocytes 57. Approximately thirty hours after the spinal anesthetic was administered, an exploration of the lower thoracic and upper lumbar cord under endotracheal ether anesthesia for what was thought to be a spinal fluid block was performed. No block was found; the cord showed only slightly increased vascularity and injection. The patient remained in the hospital three months and showed but little improvement. There was some improvement in sensation over the area supplied by the second lumbar nerve and a slight return of motor power in the feet. Although he

15. Hammes, E. M.: Neurological Complications Associated with Spinal Anesthesia (Eight Cases), Minnesota Med. **26:** 339-345, 1943.
16. Poppen, J. L., and Hurxthal, L. M.: Normal Cerebrospinal Fluid Dynamics in Spinal Cord Tumor Suspects, J. A. M. A. **103:** 391-393 (Aug. 11) 1934.
17. Babcock, W. W., in Piersol, G. M.: Cyclopedia of Medicine, Philadelphia, F. A. Davis Company, 1931, vol. 1, pp. 519-549.
18. Hyslop, G. A.: Spinal Anaesthesia, Nervous System Sequelae: A Case in Point, Surg., Gynec. & Obst. **57:** 799-802, 1933.
19. Falk, H. C.: Deaths from Spinal Anesthesia, Am. J. Surg. **11:** 461-464, 1931.
20. Jarman, R.: Recent Advances in Anaesthetics, Brit. M. J. **1:** 796-799, 1934.
21. Emmett, J. M.: Fourteen Hundred and Fifteen Spinal Anesthesias with Special Reference to Indications, Complications and Mortality, with Cases Reported and Charts, Virginia M. Monthly **62:** 304-309, 1935.
22. Foss, H. L., and Schwalm, F. L.: Relative Merits of Spinal and Ether Anesthesia, J. A. M. A. **101:** 1711-1716 (Nov. 25) 1933.
23. Woltman, H. W.: Crossing the Legs as a Factor in the Production of Peroneal Palsy, J. A. M. A. **93:** 670-672 (Aug. 31) 1929.

voided voluntarily, there was a persistent small amount of residual urine with an associated pyuria present throughout his hospital stay. He was discharged from the hospital without ever having regained the use of his lower extremities. During his stay at home over the next fourteen months there was no improvement in his condition. He died eighteen months later, and a complete necropsy, including the brain and spinal cord, was obtained. The pertinent pathologic observations were in the spinal cord.

The following is a comment by the neuropathologist: "The principal pathologic observation is the loss of nerve fibers in the roots of the cauda equina and the regeneration of fine nerve fibers in the anterior roots. The degeneration of posterior columns of the spinal cord is unquestionably secondary to destruction of posterior roots. The fibrous thickening and cellular proliferation in the meninges may be viewed as the final stage of an inflammatory process whether induced by chemical irritation or infection. The pathologic observations are approximately the type one would expect in a lesion one to two years of age. The partial sparing of some roots and the regeneration in others would account for the retention of some bladder function and sensation. There are no vascular lesions suggestive of thromboangiitis obliterans. I believe that the changes in the anterior roots which were interpreted as neurofibromatosis are regenerative phenomena. The observations are consistent with, although not pathognomonic of, the cauda equina syndrome of spinal anesthesia."

Case 2.—A white woman aged 49 had had two previous spinal anesthetics, the first on Jan. 31, 1945 for a diagnostic curettage, at which time she was given 7 mg. of tetracaine hydrochloride with dextrose. The next day she was given, by the continuous method, 12 mg. of the drug with dextrose for the excision of a right ovarian cyst which showed papillary adenocarcinoma.

Three months later the patient underwent another operation, this time at the Lahey Clinic, and tetracaine hydrochloride-dextrose spinal anesthesia by the continuous method was used. The height of anesthesia was never satisfactory, although 38 mg. of the drug was eventually injected. The level of anesthesia never went above the eleventh thoracic segment, and it had to be supplemented by the administration of cyclopropane plus curare intravenously so that a hysterectomy and appendectomy could be accomplished. The pathologic sections showed uterine carcinoma of an undifferentiated type. Seven hours after the operation the patient was still unable to move her legs. A lumbar puncture was performed which revealed a block approximately at the eleventh thoracic segment. The subarachnoid space was irrigated with isotonic solution of sodium chloride and the patient seemed to get a slight return of sensation. A laminectomy performed May 11, 1945 under endotracheal ether anesthesia revealed metastatic carcinoma to the cord, dura and vertebrae. The patient died six weeks after the onset of her neurologic complication without ever manifesting any real return of motor function to her legs.

Case 3.—A white man aged 57 had an exploratory laparotomy on July 20, 1945 under tetracaine hydrochloride-dextrose continuous spinal anesthesia plus intravenous pentothal sodium. Far advanced carcinoma of the fundus of the stomach with widespread metastases to the pelvis, retroperitoneal nodes, chest wall and liver was found. Twenty-four hours later the patient was still paralyzed from the umbilicus down. Spinal puncture at the fourth lumbar interspace showed a blockage of the cerebrospinal fluid; the subarachnoid space was flushed out with isotonic solution of sodium chloride, but the patient failed to show a return of motor function. The paralysis, which was felt to be on the basis of a metastatic carcinoma to the vertebrae and structures surrounding the cord, persisted.

Cases 2 and 3 bring out the danger that spinal anesthesia will precipitate a neurologic disease which already exists, and these cases also demonstrate the toxic properties of anesthetic agents when the local concentration is too high.

Case 4.—A white man aged 66 who had lost considerable weight underwent a subtotal gastric resection for carcinoma of the stomach on April 3, 1945. Twenty milligrams of 1 per cent tetracaine hydrochloride mixed with one and a half times as much 10 per cent dextrose was given in two doses by the continuous method to provide anesthesia for a two-hour operative procedure. The patient made an uneventful recovery and was discharged from the hospital. On a subsequent visit two months later, he was found to have a left foot drop. No other neurologic observations were discernible on physical examination. The opportunity for a follow-up study on this patient was interrupted by his death in October 1945, seven months after his operation, from recurrence of his original disease.

Case 5.—A white man aged 43 had undergone a cholecystectomy four years prior to Dec. 10, 1945 when he was seen at the Lahey Clinic because of persistent jaundice. Eight days later a repair of a common duct stricture was performed under tetracaine hydrochloride-dextrose continuous spinal anesthesia with a cyclopropane supplement. A total of 26 mg. of the tetracaine was used over a three hour period. When the patient was allowed out of bed following this operation, he noticed what he thought was some weakness in his right ankle. Three months later there was definite weakness of the dorsal flexors of the right foot as well as of the posterior tibial and peroneal muscle groups. On comparing the size of his two legs, the right calf was ¾ inch smaller than the left.

Patients Suspected of Having Postspinal Neurologic Complications

Case 6.—On May 27, 1944, a 58 year old white woman was given a spinal anesthetic consisting of 17 mg. of 1 per cent tetracaine hydrochloride plus 1.8 cc. of 10 per cent dextrose for the repair of a cystocele, rectocele and uterine prolapse. The anesthesia was satisfactory for an operation of one hour and forty minutes, and its maximum height reached the tenth thoracic segment. Three to four months after this operation the patient complained of severe pain in both legs, and this was gradually replaced by a feeling of numbness and a loss of strength which caused her to fall rather frequently. Her legs soon grew so weak that she was confined to bed. On admission to the hospital twenty months after her operation she had a cord-type bladder with an overflow incontinence. She had a loss of sensation to pin prick extending cephalad to the sixth thoracic segment. Diagnostic lumbar puncture revealed an almost complete cerebrospinal fluid block with an initial pressure of 100 mm. of water and a total protein content of 122 mg. per hundred cubic centimeters. On Feb. 15, 1946 under endotracheal ether a spinal cord tumor (meningioma) was removed opposite the sixth and seventh cervical segments. The patient made a satisfactory recovery.

Case 7.—On March 27, 1945, a 40 year old white woman was given 17 mg. of 1 per cent tetracaine hydrochloride and 2.5 cc. of 10 per cent dextrose for the removal of her gallbladder. Light cyclopropane supplementary anesthesia was administered to render her unconscious. A curare preparation had to be given intravenously to facilitate closing the peritoneum after one and one-half hours had elapsed, as the patient's abdominal muscles were no longer relaxed.

During her postoperative convalescence she complained of some pain in her right leg, hip and ankle and had an unexplained elevation of temperature. Although the signs were not definite, anticoagulation treatment was instituted on the assumption that she was suffering from a pelvic thrombophlebitis. At the end of three weeks, after being up and around the ward for two days, she left the hospital.

Eight months later the patient was readmitted to the hospital because of an obvious neurologic disturbance in the function of her legs. The reflexes were hyperactive at the knee and ankle, and clonus was present. She could raise her left leg, but all motor power in her right leg was absent except for some slight motion in the toes. A loss of sensation was elicited to the tenth thoracic segment. Constipation caused

much concern, as did an alternating urinary frequency and incontinence.

On Dec. 14, 1945 under endotracheal ether anesthesia a laminectomy was performed from the seventh thoracic to the first lumbar segment, and lysis of arachnoidal adhesions and constricting bands with decompression of the spinal cord was carried out. An intramedullary tumor at the level of the eighth and ninth thoracic segments was seen, and around this area the arachnoid was decidedly thickened with dense adhesions to the cord. Postoperatively the patient showed slight improvement with some return in motor function of the legs. Many of her neurologic signs persisted, however, and she was advised to have deep radiation therapy, which she refused.

Patients Seen in Consultation

CASE 8.—In September 1940 a white woman aged 44 received 16 mg. of tetracaine hydrochloride with 3 cc. of dextrose for a cholecystectomy. Anesthesia did not wear off. The patient showed typical signs of a cauda equina injury, with loss of bowel and bladder function and loss of motor function in the legs. This persisted for eight months, but gradually she obtained a return of motor function and was able to walk. She had signs of a cord bladder and the rectal sphincter was relaxed. After being able to carry on normal activities, she gradually grew worse and lost the use of her legs. In 1943 a laminectomy was performed for the relief of arachnoidal adhesions. During the postoperative period her atonic bladder was treated by tidal irrigation according to the method described by Munro,[24] and this caused appreciable improvement in bladder function. Following the release of the arachnoidal adhesions there was improvement in the motor function of her legs, but this improvement has not been sustained and a gradual retrogression has ensued. On examination in September 1945, spastic paraplegia with mass-type reflexes was found to be present. The saddle area was anesthetic, and there was loss of sensation to pinprick up to the eighth thoracic segment. Her bladder is of the atonic type, and the anal sphincter is relaxed. This patient, now almost totally paralyzed below the waist, is a problem in rehabilitation and will need the special care described by Munro[25] to control her spastic paraplegia and her urinary difficulties.

CASE 9.—On May 25, 1943 a white man aged 42 was given a spinal anesthetic of tetracaine hydrochloride plus dextrose for repair of a left inguinal hernia. The surgeon said the induction of anesthesia was unsatisfactory, as the patient was able to move his legs for one-half hour. Twenty-four hours later he showed loss of bowel and bladder function, with almost complete motor paralysis of his legs. All this was reported to have cleared up in three weeks.

When seen in the neurosurgical department of the clinic on Jan. 14, 1944, however, the patient had multiple complaints related to this episode. He complained of constipation, numbness in the region of the rectum and loss of sensation in the area of the scrotum and penis. Physical examination revealed an area of anesthesia over the fifth sacral nerve distribution in addition to a rather well defined area of obtunded sensation over the scrotum and penis. The rectal sphincter, although greatly relaxed, was functioning efficiently. Spinal fluid dynamics and an oxygen pneumospinogram were found to be within normal limits.

CASE 10.—In October 1945 a white woman aged 61 had her gallbladder removed under continuous spinal anesthesia. A 5 per cent procaine hydrochloride solution dissolved in spinal fluid was used. A total of 125 mg. of this drug, administered in three divided doses, provided adequate anesthesia for the operation. At the time the spinal puncture was performed, however, the patient noticed severe paresthesia which extended down the leg into the plantar surface of the right foot. After the operation it was observed that the patient had a right foot drop, a loss of sensation below the right knee and an area of saddle anesthesia which was more pronounced on the right side.

When the patient was seen in the neurosurgical department of the Lahey Clinic sixteen months later, the complications previously described were still present in the right leg. The patient was found to have normal motor power in the quadriceps, adductor and abductor groups of the thigh muscles. She was also able to carry out a few degrees of plantar flexion of the right foot. The spinal fluid dynamics as well as an oxygen pneumospinogram was found to be within normal limits. It should be noted that this patient had a radical mastectomy five months before her cholecystectomy was performed, and the possibility of metastatic malignant growths cannot be overlooked as an etiologic factor in this complication.

CASE 11.—In February 1945 a 58 year old white woman complaining of paralysis of the left leg of two years' duration was seen in the neurosurgical department of the clinic. This paralysis came on immediately after 150 mg. of procaine hydrochloride was given to provide spinal anesthesia for a hysterectomy. The patient experienced a sharp paresthesia down her left leg at the time the spinal puncture was performed. The operation was uneventful, and the return of motor and sensory function took place in a normal manner except in the left leg and sphincter vesicae. Voluntary control of urination was soon regained.

On examination two years later, there was complete loss of pain, temperature and tactile discrimination below the twelfth thoracic segment on the left side. All the muscles in the left leg were paralyzed except the quadriceps, abductor and adductor of the thigh. Although the patient could void voluntarily, 4 ounces (113 Gm.) of residual urine and persistent pyuria were present.

Cases Reported to Us by Other Surgeons and Anesthesiologists

CASE 12.—A 30 year old white woman had been suffering from an apparent radiculitis with girdle pain which extended from her neck down to her lower abdomen. Two days before an operation for acute appendicitis was performed, lesions typical of chickenpox appeared on the body. A spinal anesthetic of 15 mg. of tetracaine hydrochloride and 1.5 cc. of 10 per cent dextrose was given for the appendectomy. The appendix was gangrenous but not ruptured, and the operation was uneventful.

The postoperative convalescence was normal for six hours, with the return of sensory and motor function in the extremities. This was followed, however, by complete paralysis, both motor and sensory, below the waist, with loss of bowel and bladder function. Associated with this, the patient complained of severe pain in the back, which the consulting neurologist interpreted as being due to radiculitis. Her recovery was gradual. First, the motor power, then sensation returned to the legs, and last of all the bowel and bladder function became normal. Seven weeks after the operation the patient left the hospital apparently fully recovered. It was thought that the paralysis was the result of myelitis caused by the chickenpox virus, with the spinal anesthesia acting as the exciting agent.

CASE 13.—A 59 year old white man was given 10 mg. of tetracaine hydrochloride and 30 mg. of procaine hydrochloride for an anticipated rectal operation. The patient had a severe stabbing pain in the back at the site of the lumbar puncture; the pain came on as the anesthetic agent was injected. Sensation gradually diminished in the right leg and then in the left until the level of anesthesia reached the umbilicus. The operation was begun but had to be interrupted because of the severe pain which the patient experienced in his back. A week later he was still paralyzed below the waist and showed

24. Munro, D.: The Treatment of the Urinary Bladder in Cases with Injury of the Spinal Cord, Am. J. Surg. **38**: 120-136, 1937; Tidal Drainage and Cystometry in the Treatment of Sepsis Associated with Spinal-Cord Injuries: A Study of One Hundred and Sixty-Five Cases, New England J. Med. **229**: 6-14 (July 1) 1943.

25. Munro, D.: The Rehabilitation of Patients Totally Paralyzed Below the Waist, with Special Reference to Making Them Ambulatory and Capable of Earning Their Living: I. Anterior Rhizotomy for Spastic Paraplegia, New England J. Med. **233**: 453-461, 1945; II. Control of Urination, ibid. **234**: 207-216, 1946.

a loss of bowel and bladder control. A Pantopaque [26] spinogram was normal. The patient returned to his home where he showed gradual improvement. After three months his bowel and bladder functions were normal, and there had been some improvement in the motor power of the lower extremities. The severe pain persisted in his back. Five months after the onset of this complication, without apparent cause, he suddenly died. Permission for an autopsy could not be obtained.

The ampules containing the anesthetic agent had been soaked in a solution containing alcohol and formaldehyde, and the possibility that this corrosive mixture had leaked into one of these ampules and had ultimately been injected in the subarachnoid space was considered.

REGIMEN FOR THE PREVENTION OF POSTSPINAL NEUROLOGIC COMPLICATIONS

1. The cleansing and sterilizing of apparatus used in the administration of spinal anesthesia should be carefully supervised. The routine rinsing of syringes and needles with sterile isotonic solution of sodium chloride is an additional precaution.

2. Drugs should be used from manufacturers' ampules whose labels are legible, whose walls are intact and whose contents on routine inspection before use are clear and free from insoluble particles or crystals.[27]

3. Ampules containing spinal anesthetic drugs should be sterilized by soaking them in a nonirritating, colored sterilizing solution such as a 1 to 1,000 solution of high molecular benzalkonium chloride (Zephiran). The addition of a dye such as methylene blue to the solution in which ampules are immersed is of value in detecting the occasional defective ampule into which the sterilizing solution has leaked. Irritating solutions containing alcohol, phenol or formaldehyde should not be used because of the danger of their entering the ampule through microscopic breaks and in turn being injected into the subarachnoid space.

4. Solutions containing even a faint suggestion of turbidity or cloudiness should be discarded.

5. Spinal puncture should not be made through or near areas of infection.

6. Spinal anesthesia should not be given to patients with known spinal cord disease, such as tabes dorsalis, multiple sclerosis, pernicious anemia with symptoms of combined system disease and tumors of the spinal cord. Patients who have herniated intervertebral disks with signs of peripheral nerve paralyses, loss of bowel and bladder functions or an elevation in the total protein content of the spinal fluid should not be given spinal anesthetics.

7. Patients suffering from known virus infections such as poliomyelitis or chickenpox should not be given spinal anesthetics (for example, case 13).

8. A history of delayed return of motor function or severe paresthesias following a previous spinal anesthetic should be considered a contraindication to the subsequent use of this type of anesthesia.

9. If the spinal puncture causes a radiating paresthesia, the anesthetic agent should not be injected until adjustment of the needle has freed the patient of this pain (cases 10 and 11).

10. A persistently bloody spinal tap contraindicates the injection of a spinal anesthetic agent.

11. Routine determinations of the spinal fluid dynamics should be carried out on all patients complaining of intractable back pain or pain that seems out of proportion to the pathologic condition for which the surgical procedure is being performed. Experience has shown that spinal cord pathology (metastatic disease or primary carcinoma) can be detected in a certain number of these patients by such a routine. Hand [27] discovered 4 patients with a spinal fluid block by carrying out routine spinal fluid dynamics on a series of 60 patients whose intractable pain he was attempting to relieve by subarachnoid injections of ammonium sulfate. Cases 2 and 3 are examples of what can happen when a patient with spinal cord disease which is producing a spinal fluid block is given a spinal anesthetic.

12. When it has been difficult or impossible to obtain the desired height of anesthesia by the ordinary methods, a spinal fluid block should be suspected. It is advisable at the termination of such a spinal anesthesia to flush out the subarachnoid space with isotonic solution of sodium chloride to remove any residual anesthetic solution.

MANAGEMENT OF PATIENTS WITH CAUDA EQUINA SYNDROME FOLLOWING SPINAL ANESTHESIA

A patient who shows a delay in the return of motor and sensory function following spinal anesthesia should be considered for emergency treatment and immediate attention is warranted. Each step in the sequence of events leading up to the mishap demands careful investigation. A complete history and physical examination in addition to a review of the preanesthetic information should be obtained. The extent of the impairment of nerve function must be ascertained and recorded. It is of paramount importance that the functional state of the bowel and bladder be determined so that treatment, if needed, may be instituted immediately. Tidal irrigation of the bladder as described by Munro [24] offers a real chance for full recovery of function without infection of the urinary tract. It is extremely difficult to give an effective cleansing enema by ordinary measures to a patient whose rectal sphincter is incompetent. However, if a large Foley catheter is inserted into the

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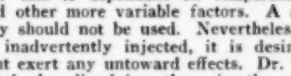
26. Pantopaque, Eastman Kodak Company, is a mixture of ethyl esters of isomeric iodophenylundecylic acids.

27. Crystals in solutions of tetracaine (Pontocaine) hydrochloride; personal communication from Dr. M. L. Tainter, Director of Research, Winthrop Chemical Company, Inc., Rensselaer, N. Y. Tetracaine hydrochloride, in common with all the synthetic local anesthetics of this general type, slowly hydrolyzes in water to produce 4-N-butylaminobenzoic acid.



This compound is 0.0087 per cent soluble in water at the p_H of tetracaine hydrochloride solutions (3.5 ± 0.5) at room temperature. It is freely soluble in the presence of traces of alkali. When the degradation of the tetracaine has proceeded to a point where the solution is supersaturated with respect to this new compound, then crystals gradually develop. The time required for this is dependent on temperature, the concentration of the solution and other more variable factors. A solution containing such crystals obviously should not be used. Nevertheless, since an occasional crystal might be inadvertently injected, it is desirable to know whether these crystals might exert any untoward effects. Dr. Tainter made a solution of these crystals by dissolving them in the required amounts of alkali and injected 300 mg. per kilogram of body weight intravenously in rats without untoward result. Tetracaine hydrohloride has an $L.D._{50}$ (dosage lethal to 50 per cent of the rats) of 6.0 ± 0.5 mg. per kilogram of body weight under the same conditions. Instillation of a suspension of the crystals into the conjunctival sac of rabbits produced no anesthetic effect in 5 out of 6 rabbits. A 1 per cent solution of butylaminobenzoic acid was injected into the subarachnoid space of rabbits in volumes of 0.02 cc. per centimeter of spinal length, which is the standard quantity used in the study of spinal anesthetics for this particular species of animal. Anesthesia did not result. One half of the animals were killed after forty-eight hours and the other half after ninety-six hours. There was no evidence of hyperemia or other inflammatory changes in any of the animals.

From these experiments Dr. Tainter concluded that the butylaminobenzoic acid sometimes found in tetracaine hydrochloride solutions as a crystalline precipitate is an inactive compound when injected intravenously or intrathecally in experimental animals.

rectum and the cuff inflated, an effective enema can be administered.

In order that preexisting pathologic change in the spinal cord may be discovered, any patient in whom there develops a postspinal cauda equinal complication should have an investigation of his spinal fluid dynamics. In conjunction with this maneuver, it is advisable to irrigate the subarachnoid space with isotonic solution of sodium chloride to insure the removal of any remaining anesthetic agent. This attempt to remove any residual anesthetic agent takes on additional significance when a spinal fluid block is discovered. When the abnormal observations in the spinal fluid are limited to an elevation in the total protein and in the lymphocytic cell count, daily spinal punctures for the withdrawal of fluid should be performed.

During the period of recovery, the duration of which may be extremely variable, the nursing routine must be a vigorous one if decubital ulcerations, ankylosed joints, malnutrition and muscular atrophy are to be avoided.

Certain of these complicated cases may require special and intensive treatment before the patient can be rehabilitated. Especially is this true of those patients who suffer from uncontrolled urination or those in whom there has developed a spastic paraplegia with mass reflexes. If tidal irrigation is properly applied over a sufficiently long period, Munro [23] has stated that: "Every patient who has sustained an injury to the spinal cord, conus or cauda equina who is intelligent and cooperative can have infallible twenty-four-hour control of urination." Munro [25] has also shown that patients paralyzed below the waist can be made ambulatory and capable of earning a living. He advocates anterior rhizotomy for the relief of the spasticity. Then, by the use of braces and crutches, these people can be made ambulatory.

ABSTRACT OF DISCUSSION

DR. J. ARCHER O'REILLY, St. Louis: I feel that a spinal puncture or the giving of spinal anesthesia should be considered a major surgical procedure. I think, sometimes, that fact is overlooked. In the St. Louis University group of hospitals it is required that a trained medical anesthetist shall give all spinal anesthesias and supervise them. For that reason we probably have comparatively few complications. In reviewing the cases that have been treated by the orthopedic service—and a good many patients have had spinal anesthesias under other men—I cannot find any very serious complications. We have had headaches, but I cannot think of any serious paralysis or any other complications. Again I think that is probably due to the fact that we insist on having trained men. I feel that from this paper there is a definite lesson to be learned. Complications are fairly frequent. Some of the complications are very serious. One of the things we must learn is that the surgeon must know his patient. The surgeon who uses spinal anesthesia to any great extent should have enough experience and should be able to evaluate the patient and be able to understand the possibilities of complication before he jumps into a spinal anesthesia. That is a serious and vital responsibility on the part of the operating surgeon. What I get from this paper is the fact that spinal anesthesias may cause considerable damage. The point that is especially important is the fact that spinal anesthesias should be given by men who are competent and should be under the supervision of surgeons who know what spinal anesthesia is and may do and that it should not be entered into lightly.

DR. A. M. CAINE, New Orleans: I want to emphasize something said; that is, the coloring of the solution in which the ampules are kept. I had two sloughs in the skin from the administration of a small portion of 1 per cent procaine with ephedrine. I could not think of any reason why that took place, and since I could not think of any other reason I put my ampules in a colored solution, since which time I have found a dozen that were colored. There is no reason at all why, in using solutions of procaine that are made instead of crystals—or pontocaine or nupercaine, or any other agent—one should not get some alcohol in these solutions unless they are put up in a container with a colored solution, so that one can find out. I have thought that a good many complications might be due to the size of the needle until I found out the size of the needle that the neurologists use in spinal puncture, which is a very large needle indeed. They have many headaches, and they expect them. I think the size of the needle may have something to do with the headaches. But from what Drs. Nicholson and Eversole say practically no neurologic complications have been reported by them. But I know of 1 case in which, when the anesthetist pulled the stilet out, blood came trickling out. She put it back half an inch and put it into the spinal canal. That particular operation was for abdominal anal resection. No complication had been reported to me or to our anesthetist. The patient reported to me ten months later that his whole bottom had been dead ever since the operation. I feel that in this case it was due to a hematoma resulting from the original puncture, which went all the way through and a half inch back before the anesthetist got back into the subarachnoid space.

CAPTAIN JOHN DILLON, M. C., A. U. S.: It is absolutely necessary that studies of anesthetic complications be made. However, there is one thing that has not been brought out. That is the relationship of these complications to the drug, the amount of the drug and the hypobaricity or the hyperbaricity of the drug. These things are very important. I cannot speak from personal experience or give any data on this topic, but if the subject is to be worked out so that these complications will be cut down to a minimum some thought must be given to these factors, particularly to the hyperbaricity. We are not at all certain as to how spinal anesthesia works, or at all sure how any anesthesia works, for that matter, but it would seem that there must be some surface phenomenon which goes on between the nervous tissue and the drug which is opposed to it, and that the osmotic relationship between these two surfaces come into play. As Dr. Betlach brought out, you can get perfect anesthesia with 35 mg. of spinal anesthesia. I wish to go further and say that I have seen it as low as 12.5 mg. I wonder sometimes if we are not hitting a tack with a sledge hammer, because in years gone by it was nothing to read that a patient had been given 300 mg. of procaine for operations that certainly did not require it.

DR. URBAN H. EVERSOLE, Boston: As Dr. O'Reilly pointed out, the incidence of neurologic complications following spinal anesthesia is very low. In our own experience we gave approximately 21,000 anesthetics by the same technic before we had a serious neurologic complication. On the other hand, this low incidence must not lead us to minimize the gravity of such a complication. I certainly agree with Dr. Dillon that it is important to consider these complications in relation to the specific gravity of the anesthetic mixture employed. There is little doubt that neurologic complications following spinal anesthesia bear a definite relationship to the concentration of the drug. Clinical evidence of this is that most of these complications are in the cauda equina, where the drug is most likely to be present in the highest concentration. We know that the concentration of an anesthetic agent at any given point in the spinal canal has a very definite relationship to the specific gravity of the solution employed. As mentioned in the paper, the concentration commonly employed for spinal anesthesia may be but little short of that which would cause neurologic complications in a much greater number of patients.

SUBDURAL HEMATOMA

HAROLD C. VORIS, M.D.
Chicago

This report is based on the observations in 100 consecutive patients with subdural hematoma on whom I have operated. This group of cases is large enough to be somewhat heterogeneous but has many common features. Cases of infantile subdural hematoma have not been included. The majority (73) of the patients are from my neurosurgical service at the Cook County Hospital, the rest (27) from my private practice. They represent an eleven year period, from 1935 to 1945 inclusive. Hematomas less than 3 mm. in thickness or an estimated 10 cc. in volume are not included.

The subject of subdural hematoma has aroused great interest in the past, and an extensive literature has accumulated. Groff and Grant [1] prepared an excellent collective review in 1942 in summary of the literature to that date. They classified the causes under the headings "spontaneous" and "traumatic." Under each of these headings primary and secondary causes were listed. Primary spontaneous causes were infectious and neoplastic; secondary spontaneous causes were the predisposing factors of systemic disease, alcoholism, arteriosclerosis and blood dyscrasias. Trauma was described as a primary cause and also as a secondary or precipitating cause in the presence of one of the predisposing factors listed under spontaneous causes.

PATHOGENESIS

In the recent literature the trend has been to consider trauma as the most important etiologic factor. The normal anatomy of the cerebral veins has long been recognized as important in the production of subdural hemorrhage. The term "bridging veins" may be applied to the veins that cross the subdural space to the dural venous sinuses and also to the veins that cross the subdural space traveling between the arachnoid and dura but emptying directly into any sinus. The first group includes the superior cerebral veins, the inferior cerebral veins that enter the sphenoparietal sinus and the veins that enter the lateral sinus from the posterior or inferior surface of the temporal lobe. Other veins cross from the cerebral arachnoid of the convexity of the hemisphere to the dura at a distance of 1 to 4 cm. from the superior longitudinal sinus, traverse the subdural space from the arachnoid of the base of the temporal lobe to the dura of the middle fossa and to the tentorium cerebelli, cross from the tip of the temporal lobe to the dura over the sphenoid bone, or enter the dura from the lateral convexity of the hemisphere at any point. All these veins are familiar to the neurosurgeon because they limit his manipulations when he explores the subdural space.

It is obvious that displacement of the brain in the intracranial cavity, especially in the longitudinal axis, may tear these veins as they cross the subdural space and may produce primary subdural hemorrhage. Beginning with Trotter [2] many authors have recognized this as the probable initial step in the production of a subdural hematoma. However, experimental proof of this has been lacking until Sheldon, Pudenz and Restarski [3] demonstrated experimentally subdural ("sublucite") venous bleeding following parietal subconcussive blows in monkeys in whom the convex portion of the skull had been replaced by a transparent Lucite calvarium. This experimental demonstration supports the clinical supposition that an initial hemorrhage into the subdural space is the first stage in the development of a subdural hematoma. Such hemorrhage is most apt to occur from superior cerebral veins but often occurs from other groups, so that while the majority of traumatic subdural hematomas occur over the convexity of the cerebral hemisphere they are found inferiorly in the temporal region both anteriorly and posteriorly, occasionally beneath the frontal and temporal lobes and even in bizarre locations, such as between the hemispheres (Aring and Evans [4]) or beneath the tentorium cerebelli (Munro [5]).

In the present series trauma was by far the most important factor, as a definite history of antecedent injury to the head was obtained in 96 of the cases. The time between the injury and the operation ranged from a few hours to six months. Injuries which dated back more than six months from the time the patient was first seen were not accepted as possible causes; in fact, any injury which occurred more than three months before the onset of symptoms was regarded with suspicion. There were only 2 such cases in the series.

In the great majority of instances the clots were located over the superior convexity of the hemisphere. Some were more lateral and inferior, extending down to the base. None was truly beneath the hemispheres, and there were no subtentorial hematomas in this series.

Although trauma was the primary causative factor in the vast majority of the cases, there were a few patients with other preexisting cerebral lesions that obviously predisposed to the subdural hemorrhage.

Neoplasm has frequently been mentioned as a predisposing factor. Russell and Cairns [6] reported 4 cases of carcinomatosis and sarcomatosis of the dura with formation of a subdural false membrane. In 1 patient in this series a subdural hematoma was found over a glioblastoma multiforme of the temporal lobe.

A 45 year old man was struck on the forehead by a heavy object and knocked down. He was dazed but did not lose consciousness. After this incident headaches persisted, and two months later disorientation and mental confusion appeared. Six months after the injury right hemiparesis and aphasia developed and he was admitted to the Cook County Hospital, eight months after the injury. At the time of admission he was stuporous, with complete right hemiplegia and aphasia and bilateral papilledema of 2 to 3 D. The pressure of the spinal fluid was 210 mm., and the fluid was xanthochromic. Because of the history of injury, a subdural hematoma was suspected, although the interval seemed rather long. Bilateral parietal bur holes did not confirm the suspicion. Ventriculography revealed a space-occupying lesion in the left frontotemporal region. An osteoplastic craniotomy revealed a small completely organized subdural hematoma in the left anterior temporal region. The membranes of this hematoma were completely fused with organization of the contents. The hematoma was only 3 mm. thick. Beneath it a glioblastoma multiforme came to the surface of the anterior part of the temporal lobe.

From the Clinics of Mercy Hospital and Loyola University and from the Cook County Hospital.

Read before the Section on Nervous and Mental Diseases at the Ninety-Fifth Annual Session of the American Medical Association, San Francisco, July 3, 1946.

1. Groff, R. A., and Grant, F. C.: Chronic Subdural Hematoma, Internat. Abstr. Surg. **74**: 9-20, 1942; in Surg., Gynec. & Obst., January 1942.

2. Trotter, W.: Chronic Subdural Haemorrhage of Traumatic Origin, and Its Relation to Pachymeningitis Haemorrhagica Interna, Brit. J. Surg. **2**: 271-291, 1914.

3. Sheldon, C. H.; Pudenz, R. H., and Restarski, J. S.: The Lucite Calvarium; a Method for Direct Observation of the Brain: II. Cranial Trauma and Brain Movement, Naval Medical Research Institute and United States Naval Hospital, Research Project X-182, Report no. 2, 1946.

4. Aring, C. D., and Evans, J. P.: Aberrant Location of Subdural Hematoma, Arch. Neurol. & Psychiat. **44**: 1296-1306 (Dec.) 1940.

5. Munro, D.: The Diagnosis and Treatment of Subdural Hematomata, New England J. Med. **210**: 1145-1160, 1934.

6. Russell, D. S., and Cairns, H.: Subdural False Membrane or Hematoma (Pachymeningitis Interna Haemorrhagica) in Carcinomatosis and Sarcomatosis of the Dura Mater, Brain **57**: 32-48, 1934.

In another patient a subdural hematoma lay over a vascular malformation of the temporal lobe.

A 28 year old man, a teacher, had been struck over the head two months before I saw him. He had a headache for a few hours but had not lost consciousness and thought that his injury was inconsequential. A month later he began to have seizures involving the upper part of the right arm and the right side of the face without loss of consciousness but with inability to speak during the seizure. The tendon reflexes were exaggerated on the right, there was a right Hoffmann sign and bilateral papilledema of 1 to 2 D. The injury was considered inconsequential and a diagnosis of left cerebral tumor was made. Osteoplastic exploration revealed a chronic encapsulated subdural hematoma over the left frontoparietotemporal region with its greatest thickness over the temporal lobe. It was removed *in toto* and measured 7.4 by 4.5 by 1 cm. Its removal revealed an arteriovenous anomaly of the entire temporal lobe. The sylvian vein was 1 cm. in diameter, and two pencil-sized vessels connected it with the superior longitudinal sinus. These vessels pulsated and obviously carried a mixture of arterial and venous blood. The surface of the temporal lobe was replaced by a pulsating mass of vessels of various sizes. Surgical attack was not attempted because of the location of the lesion on the left side and the obvious immediate danger of such a procedure.

A third subdural hematoma was found in the course of a surgical attack on an intracranial aneurysm.

A 37 year old woman was first seen twelve hours after a severe spontaneous subarachnoid hemorrhage. At that time she was comatose, with a left hemiplegia and a complete right oculomotor palsy. She gradually improved, and six weeks later a cerebral arteriogram revealed a small berry aneurysm of the right anterior cerebral artery about 5 mm. from its origin. A right transfrontal craniotomy was performed, and the right anterior cerebral artery was occluded with a clip proximal to the aneurysm. At this exploration a small, 1 mm. thick, completely organized subdural hematoma was found over the inferolateral aspect of the right temporal lobe.

These 3 cases are of great interest, although they represent only a small fraction of the series. In all 3 instances the arachnoid must have been torn; in the first 2, possibly by trauma, and in the third, perhaps by the force of the hemorrhage. Blood thus entered the subdural space and, possibly because of a ball-valve action of the tear in the arachnoid, remained entrapped in the subdural space. All 3 cases may represent spontaneous hemorrhage; certainly the third does. However, there was a definite history of trauma in the first 2.

The relation of acute and chronic subdural hematoma is a debated point. Groff and Grant suggested the use of the term subdural hemorrhage for the early acute cases and subdural hematoma for the later subacute or chronic cases. Leary [7] classified subdural hematomas under five heads: (1) fresh fluid or soft clots, (2) firm clots, (3) chocolate-colored fluid with a neomembrane on the dural side, (4) chocolate-colored fluid enclosed in a double neomembrane and (5) a fused double subdural neomembrane with absorption or complete fibrous organization of the previously enclosed hematoma.

The important difference between the acute and chronic types is the relative size of the early hemorrhage. Generally the so-called early or acute subdural hematoma is a relatively massive, acute hemorrhage, usually associated with severe cerebral injury, either contusion or laceration. Probably as a rule, the arachnoid is extensively torn and the subdural blood is in free communication with the subarachnoid space. If the patient survives the injury to the brain and the early effects of the cerebral compression, the subdural hemorrhage is absorbed by virtue of its communication into the subarachnoid space. This does not always occur, but seldom do severe cases of injury to the brain later exhibit a chronic hematoma. Such a case is seen infrequently; perhaps here the tear in the arachnoid is small and acts as a ball valve to trap the blood in the subdural space.

Blood trapped in the subdural space is not absorbed. Gardner,[8] Zollinger and Gross [9] and Munro and Merritt [10] developed the now widely accepted theory that the large chronic subdural hematomas result from relatively small initial hemorrhages in the subdural space. In the absence of cerebral injury with bleeding from cortical vessels, the venous pressure in the cerebral veins is so low that bleeding from them soon stops spontaneously. As liquefaction of blood in the subdural space begins, the resultant fluid is high in protein content. Since it is separated from the subarachnoid space by only the arachnoid (and much later by the newly developing neomembrane on the arachnoid side) and since this is impermeable to the large molecules of protein in the liquefying blood, an osmotic imbalance which exists between the cerebrospinal fluid and the liquefying blood in the subdural space results in the passage of fluid into the subdural space. As time goes on and the hemoglobin molecules begin to break down, there is a great secondary increase in molecular concentration following the break-up of the large protein molecules; consequently, there is a late secondary tendency to an increase in the size of the clot.

Many surgeons have felt that repeated hemorrhages were the explanation for the growth of the clot. Certainly when the initial hemorrhage is spontaneous or when a predisposing cause is present there may be successively repeated hemorrhages. Putman,[11] Baker [12] and others have described microscopic evidence of fresh bleeding in the vessels of the membranes of subdural hematomas. However, gross evidence of such bleeding is lacking. None of the hematomas in this series, whatever their age or stage, show lamellation or other evidence of repeated bleeding. In 1 or 2 cases, when the clot was removed fresh bleeding appeared from torn but previously thrombosed veins, but evidence of recent bleeding into the hematoma was not seen. In 1 case, after evacuation of the hematoma the exposed end of a torn but thrombosed cerebral vein was seen above the arachnoid directly beneath the exploratory opening in the parietal region. When the vessel was lightly sponged it began to bleed and required electrocoagulation. The hematoma was thickest over this point and from the history was five days old. It was thought to have been due to a tear of this anomalous "bridging vein" on the parietal convexity of the hemisphere. Loss of blood from this vessel had spontaneously stopped only to recommence after evacuation of the overlying hematoma and the slight trauma of sponging.

An essential question is the primary location of the bleeding, whether subdural or intradural. If it is due to tear of bridging veins, the bleeding must of

7. Leary, T.: Subdural Hemorrhages, J. A. M. A. **103**: 897-903 (Sept. 22) 1934.

8. Gardner, M. J.: Traumatic Subdural Hematoma: A Report of Twenty-Two Cases, Ohio State M. J. **31**: 660-665, 1935.

9. Zollinger, R., and Gross, R. E.: Traumatic Subdural Hematoma: An Explanation of the Late Onset of Pressure Symptoms, J. A. M. A. **103**: 245-249 (July 28) 1934.

10. Munro, D., and Merritt, H. H.: Surgical Pathology of Subdural Hematoma, Arch. Neurol. & Psychiat. **35**: 64-78 (Jan.) 1936.

11. Putman, T. J., and Putman, I. K.: The Experimental Study of Pachymeningitis Hemorrhagica, J. Nerv. & Ment. Dis. **65**: 260-272, 1927.

12. Baker, A. B.: Subdural Hematoma, Arch. Path. **26**: 535-559 (Aug.) 1938.

course be subdural. However, Baker,[12] Hannah,[13] Kamp and Love[14] and others have presented histologic evidence to indicate the intradural origin of these hemorrhages. The most satisfactory histologic preparations come from postmortem rather than from surgical specimens. As a result, the average pathologist is better acquainted with material from large, well encapsulated hematomas of relatively long standing. Leary,[15] who had an enormous experience with subdural hematomas in all stages of their development, was convinced of their subdural rather than intradural origin.

From the surgical point of view three facts can be emphasized:

1. Early traumatic subdural hematomas are not encapsulated, and the inner aspect of the dura lacks evidence of reaction.

2. The first neomembrane to be formed is the one on the dural side, and it is well developed before any definite membrane can be found on the arachnoid side.

3. Only in old cases are there two neomembranes equal in development on the dural and arachnoid sides of the hematoma. The early development of the neomembrane on the dural side is to be expected if the initial hemorrhage is subdural, because reaction to a foreign body is much more prompt and more pronounced in the dura than in the arachnoid. If the hemorrhages were really intradural and the inner (arachnoid side) neomembrane represented the inner layer of the dura, it should be present from the onset. At operation the dura always separates readily from the neomembrane of the hematoma. In early cases the inner surface of the dura appears grossly normal; in older cases the dura may appear thickened, with the inner surface roughened and discolored.

Groff and Grant[1] supported the intradural theory by pointing out the tendency of these hemorrhages to predominate over the superior convexity of the hemisphere. They stated that this collection of blood and fluid over the superior convexity of the hemisphere defied gravity and favored an intradural rather than a subdural location. However, the living brain behaves physically as a semisolid. When the dura is opened at operation in the absence of increased pressure the brain falls away from the dura and settles down into the intracranial cavity. It probably does the same thing when bleeding occurs into the subdural space over the convexity of the hemisphere, thus preventing the blood from settling to the base. According to Munro and Merritt[10] the age of a subdural hematoma can be rather accurately determined by microscopic study of the neomembranes and total protein determinations of the fluid removed at operation. I have not been able consistently to correlate these factors with the known histories of injury. The 2 following cases illustrate the difficulty in such correlation.

A 30 year old man fell and struck the back of his head six weeks before admission to the hospital. Headache had been present since the fall, and his family and the patient (later) were certain there had not been any other injury. He was stuporous, with bilateral papilledema and left hemiparesis. At operation a large semisolid subdural clot was found in the left parietotemporal region without evidence of liquefaction, neomembrane formation or dural reaction. Grossly, it appeared to be of recent origin, at most a few days old.

A 31 year old man received a blow to his head two hours before admission to the hospital. He was stuporous at admission, and he fluctuated between semicoma and periods of relative responsiveness and confusion during the next five days. Left hemiparesis developed. The spinal fluid pressure was 110 mm. and the fluid was xanthochromic. Surgical intervention revealed a right subdural hematoma that was largely liquefied, although partially organized fragments of clot were evacuated. A well formed neomembrane was present on the dural side and a definite but less well developed neomembrane next to the arachnoid.

These 2 cases stand in decided contrast to each other and illustrate the variability between the age and the stage of the development of the hematoma. These variations are probably due to differences in the size of the initial hemorrhage, to whether or not the arachnoid is injured and to individual variations in the reaction of the dura to blood in the subdural space.

The relation of subdural hygroma to subdural hematoma must be considered. Many have considered this lesion to be a variant of subdural hematoma, representing cases of an extremely limited initial subdural hemorrhage which eventually as a result of great dilution by osmosis became only xanthochromic fluid. The protein content of these fluids is surprisingly high, although they do not coagulate when removed. In 1 case the fluid removed at operation contained 2,000 mg. of total protein. Da Costa and Adson[16] considered subdural hygroma to be a separate clinical entity. They reported a case in which a tear in the arachnoid was demonstrated at operation. It had apparently not only allowed cerebrospinal fluid to enter the subdural space but also acted as a valve to prevent its return to the subarachnoid space.

In the present series there were 9 cases classified as subdural hygroma. Six of these were from two to six weeks old; the other three, a week or less. It appears that the first group might well represent the end stage of dilution of an exceedingly small subdural hemorrhage. In all these cases there were well developed neomembranes. The 3 recent cases lacked neomembranes, and it is likely that they were formed by the mechanism demonstrated by Da Costa and Adson.[16] In all 3 cases there was an associated contusion or laceration of the brain. Subarachnoid hemorrhage with consequent admixture of blood with the spinal fluid would account for the xanthochromia. Unfortunately, total protein determination was not performed in these cases. Scott[17] reported a case of acute subdural hygroma which consisted of clear fluid with a simulation of extradural hemorrhage. It seems that adequate proof of a subdural hygroma should consist of demonstration of (1) a tear in the arachnoid, (2) xanthochromic fluid or (3) high protein content in the fluid.

SYMPTOMS AND DIAGNOSIS

Men and women are probably equally susceptible to subdural hematomas, but as a result of the greater frequency of head injury in males such injuries are much more common in that sex (table 1). Subdural hematoma occurs at any age but is rare between infancy and young adulthood. The fourth, fifth and sixth decades of life provide the most cases. As in head injury generally (Voris, 1945[18]), the increasing age of the patient is an important factor in the deter-

13. Hannah, J. A.: The Aetiology of Subdural Hematoma, J. Nerv. & Ment. Dis. **84**: 169-186, 1936.
14. Kamp, D. H., and Love, J. G.: "Subdural" Hematoma, Surg., Gynec. & Obst. **67**: 87-93, 1938.
15. Leary, T.: Subdural or Intradural Hemorrhages? Arch. Path. **28**: 808-820 (Dec.) 1939.
16. Da Costa, D. G., and Adson, A. W.: Subdural Hydroma, Arch. Surg. **43**: 559-567 (Oct.) 1941.
17. Scott, M.: Acute Subdural Hydroma Simulating Syndrome of Extradural Hemorrhage, Surgery **13**: 152-153, 1943.
18. Voris, H. C.: Factors Influencing Mortality in Head Injury, Radiology **44**: 166-170, 1945.

mination of mortality. In a previous paper (Voris, 1941 [19]) the common signs and symptoms of subdural hematoma have been discussed. Experience with a larger group of cases has changed my opinion in regard to the relative frequency of some of the signs and symptoms; it has not otherwise altered the opinions I expressed in 1941.

The differentiation between acute and chronic forms of subdural hematoma is important not only from the standpoint of pathogenesis but also from that of treatment and prognosis. The most convenient classification from a clinical point of view is on the basis of elapsed time between the injury and the operation on the patient (table 2). That the elapsed time was between injury and surgical intervention, not between injury and the onset of symptoms should be kept in mind. In many of the older cases symptoms such as headache, dizziness or mental disturbance had been present for some time before surgical intervention, perhaps even from the time of injury.

The high mortality in acute subdural hematoma is seen at a glance. It is prohibitive for the very early cases and extremely high during the first week. Ten cases in which the operation was performed within three days after the injury was sustained were reported in 1941; in only 4 additional cases have acute subdural hematomas been operated on since, and those under the diagnosis of extradural hemorrhage.

TABLE 1.—*Distribution of Patients by Age and Sex with Mortality Rate for Each Decade*

	Total	10-20	20-30	30-40	40-50	50-60	60-70	70+	?
Males	88	1	10	16	27	17	13	1	3
Females	12	..	1	5	2	1	3	..	..
Recovered	70	1	10	16	21	15	7	..	..
Dead	30	..	1	5	8	3	9	1	3

The clinical differentiation between acute subdural and extradural hemorrhage is often difficult, if not impossible. The early subdural hemorrhages are generally massive; they are always associated with cerebral injury and often with laceration. The bleeding is usually venous but may be arterial from torn cortical vessels. As previously indicated, since 1941 I have operated on these patients only in the course of explorations for extradural hemorrhage. The acute subdural hemorrhage it is well to leave alone. If the patient survives, the hemorrhage is perhaps often absorbed through tears in the arachnoid. As previously stated, chronic subdural hematoma is not often seen in patients with severe early symptoms after injury to the head.

The clinical course of chronic subdural hematoma is of two general types. In the first, subjective symptoms are present from the time of a mild or moderately severe head injury. These cases predominate in this series. In the majority, the relationship of the injury to the symptoms is evident; the only question is the existence of a subdural hematoma.

In another group of patients, the injury was trivial, has been forgotten, or is not known to friends or relatives. These patients are suspected of having a brain tumor, cerebral vascular disease, an encephalopathy or encephalitis. If mental symptoms predominate, the diagnosis of one of the psychoses may be made. If the patient is admitted to the hospital in coma, uremia or diabetes may be suspected. In this instance the value of spinal puncture in the differential diagnosis of coma should be emphasized. Fluctuation of symptoms, especially of the state of consciousness, is often seen and is at times dramatic.

A 66 year old man was seen late at night in consultation. He was deeply comatose, with generalized rigidity of the extremities, Cheyne-Stokes respirations and a rectal temperature of 105 F. The spinal fluid was said to have been clear but under increased pressure. The optic fundi were not elevated. He was thought to be moribund, but the administration of 100 cc. of 50 per cent sucrose intravenously was advised and a ventriculogram was planned for the next morning if he survived. By morning (eight hours later) he was conscious, alert and asking for food. His family refused to permit a surgical procedure at that time. A history of slight injury to the head five weeks previously was obtained. The diagnosis was changed from a suspicion of brain tumor to subdural hematoma, and relapse was predicted. Three days later the patient lapsed again into coma. The family readily consented to an operation, which revealed bilateral, large, fairly well encapsulated, liquid, subdural hematomas. Recovery was uneventful.

TABLE 2.—*Classification of Patients, with Mortality According to the Period from Injury to Operation*

	1-3 Days	3-7 Days	1-4 Wks.	1 Mo. or More	No History of Injury
Total	14	9	47	26	4
Recovered	1	3	40	22	4
Dead	13	6	7	4	..

Some type of mental disturbance ranging from a mild personality change to stupor or coma was the most common observation (table 3). The mental picture may fluctuate greatly but grows worse with the passage of time. Confusion and disorientation which progress to stupor and coma are the most commonly observed manifestations. Simulation of one of the organized psychoses is infrequent but occasionally occurs.

Weakness or paralysis of one side of the body with abnormal or pathologic reflexes is usually contralateral to the hematoma; occasionally the contralateral crus cerebri is pressed against the free edge of the incisura tentorii, and hemiparesis and pyramidal tract signs are thus produced homolateral to the clot. Some type of localizing neurologic observations were present in 75 cases; contralateral to the lesion, in 63; homolateral, in 12. The presence of hemiparesis or signs of unilateral involvement of the pyramidal tracts after a head injury, especially if progressive, is strong presumptive evidence of a hematoma, but these results may be produced by localized injury to the brain.

TABLE 3.—*Signs and Symptoms in One Hundred Surgically Verified Cases of Subdural Hematoma*

Mental disturbances	90	Papilledema	37
Localizing pyramidal signs	75	Convulsions	29
Contralateral	63		
Homolateral	12	Slow pulse	29
Headache	62	Spinal fluid examination	85
		Bloody	14
Dilatation of pupil	45	Xanthrochromic	55
Contralateral	5	Clear	16
Homolateral	40		

Headache, as might be expected, was a common symptom, which occurred in 62 cases. Unilateral dilatation of the pupil occurred in 45 patients. It was homolateral to the lesion in 40 and contralateral in 5. It is thus not only a valuable symptom of a developing

19. Voris, H. C.: The Diagnosis and Treatment of Subdural Hematomas, Surgery **10**: 447-456, 1941.

hematoma but also a valuable localizing sign. When the dilatation is contralateral to the hematoma the possibility exists of injury to the brain on the side of the dilated pupil.

Papilledema was present in 37 patients. As might be expected, these were all patients who had injuries of five days' duration or longer. I have not seen papilledema earlier than five days after injury.

Convulsions were seen in 29 cases. This is about the frequency generally reported for neoplasm of the cerebral hemisphere. When they occur unilaterally, convulsions are of great localizing value. When they occur after a cerebral injury, they strongly suggest a subdural hematoma, although they may be the result of localized cerebral contusion or edema.

Occasional bradycardia with a pulse rate below 60 was seen in 29 cases. It is seldom persistent but does tend to be recurrent. It is usually observed only by review of the hospital chart over a period of several days; consequently it is easily, and undoubtedly often, overlooked in patients who have been in the hospital only a short time before surgical intervention.

Examination of the spinal fluid was carried out in 85 cases. It was bloody in 14 (all within fourteen days after injury). In 55 patients (65 per cent) it was xanthochromic; in 16, clear. Aside from the early cases of patients with bloody spinal fluid, xanthochromia was found in 77 per cent of those examined. Clear spinal fluid does not rule out, or even make unlikely, the presence of a subdural hematoma, but xanthochromic spinal fluid usually indicates the diagnosis. However, if there is less than two weeks' time between the injury and the examination of the spinal fluid, the xanthochromia has to be disregarded, since it may be the result of subarachnoid hemorrhage suffered at the time of the injury. Observation of the data on the spinal fluid in a large number of cases of traumatic subarachnoid hemorrhage indicates that the spinal fluid will be clear within twelve to fourteen days after a cerebral injury unless there is a developing subdural hematoma.

Most important of all in the diagnosis of subdural hematoma is the alertness of the clinician. This alertness must include the realization not only that subdural hematoma is one of the most frequent surgical complications of head injury but also that any patient with the signs and symptoms of cerebral disease may have this condition. It is especially to be considered in "stroke" or "mental disease" or when the patient is in coma. The manifestations are protean, and there is no constant factor short of surgical exploration that will definitely establish the diagnosis.

The value of air studies is debatable. Davidoff and Dyke [20] were of the opinion that the encephalogram (spinal air) is of diagnostic importance. Others (e. g. Bull [21]) have emphasized the difficulties of diagnosis by means of air studies. The procedure of ventriculography has often led directly to the correct diagnosis, for when the surgeon made bur holes in the skull for the injection of air, the presence of the subdural hematoma was recognized. This occurred in 1 case in this series.

A 15 year old boy had been "knocked out" while boxing two months previously. A month later headaches, dizziness and vomiting began. Examination revealed ataxia, papilledema and right lateral rectus paresis. A suboccipital tumor was suspected because of the youth of the patient, the ataxia and the lack of lateralizing signs, and ventriculography was advised. When a bur hole was placed in each parietooccipital region, a liquid subdural hematoma of moderate size with well developed neomembranes was revealed on the left side. It was satisfactorily drained, and recovery was uneventful.

A case has already been described in which a small, anterior, organized subdural clot was not revealed by a parietal bur hole and, consequently, ventriculography was performed. In another case ventriculography was performed because of suspicion of a brain tumor. This yielded evidence of a right frontal space-occupying lesion. Craniotomy revealed a small, chronic, subdural hematoma over the right frontal lobe. This patient later recalled several minor head injuries in the preceding six months. In 3 other cases in which a tumor of the brain was suspected, encephalography was performed and revealed evidence of a space-occupying lesion. Craniotomy revealed the true nature of the lesion in 2 of these cases; in the third, the hematoma was drained in the usual way through a parietal bur hole.

TREATMENT

Trotter,[2] who was the first modern surgeon to interest himself in this condition, used trephine openings to evacuate the clots. This procedure seemed to be forgotten and osteoplastic craniotomy was generally employed until Fleming and Jones [22] and McKenzie [23] independently advised, in 1932, simple drainage through bur holes. This method was used in all but 8 cases in this series. In 4 of these cases, the method was used after the air studies to which reference has been made. One case already described was an instance of intracranial aneurysm. Here the small subdural hematoma was an incidental discovery. In another patient who failed to rally after drainage of a large, well-encapsulated clot, an osteoplastic craniotomy was carried out nine days later and the entire neomembrane meticulously removed. In spite of this, death occurred two days later. It was felt that this death was due to a failure of the brain to expand after removal of the hematoma. In another case osteoplastic craniotomy was necessary to remove a completely organized clot that was 2 cm. thick. Here the neomembranes were fused and the interior of the mass completely organized. This occurs rarely; such clots cannot of course be evacuated through bur holes. In the eighth case a parietal bur hole revealed the edge of a solid, unencapsulated clot in the inferior temporal region. This might have been evacuated through multiple bur holes but was removed through an osteoplastic craniotomy.

It is my practice to place these patients flat on their back with the head of the table elevated 10 to 15 degrees. The entire head is shaved and after surgical preparation is draped so as to expose practically the entire convexity of the skull. The operation can generally be done under local anesthesia, but if the patient is too restless or uncooperative for this, intravenous Sodium Pentothal or a preliminary dose of tribromoethanol may be used as a basal anesthetic.

Vertical incisions 4 cm. in length are made on each side of the scalp above the lobe of the ear and just above the insertion of the temporal muscles. Scalp clips or forceps on the galea control the hemorrhage of the scalp and small self-retaining retractors expose the bone. Bur holes are then made just above the insertion of the temporal muscle on each side. If the

20. Dyke, C. G., and Davidoff, L. M.: Chronic Subdural Hematoma: A Roentgenographic and Pneumencephalographic Study, Bull. Neurol. Inst. New York **7**: 112-147, 1938.
21. Bull, J. W.: The Radiological Diagnosis of Chronic Subdural Hematoma, Proc. Roy. Soc. Med. **33**: 203-224, 1940.
22. Fleming, H. W., and Jones, O. W.: Chronic Subdural Haematoma, Surg., Gynec. & Obst. **54**: 81-87, 1932.
23. McKenzie, K. G.: A Surgical and Clinical Study of Nine Cases of Chronic Subdural Hematoma, Canad. M. A. J. **26**: 534-544, 1932.

dura is discolored, the bur hole may be enlarged with the rongeur to an opening approximately 3 cm. in diameter. This gives more room for manipulations. Almost always the appearance of the dura reveals the underlying hematoma, if one is present. The underlying blood gives the dura a characteristic plum-colored appearance. A bur hole in this location will reveal the lesion in the vast majority of subdural hematomas. The lesion of necessity assumes the shape of a convex lens spread out over the surface of the hemisphere but thickest at the point of origin. If a hematoma is not disclosed on either side, additional bur holes may be made in the frontal and inferior temporal region, or ventriculography may be performed. It seems less time-consuming to depend on ventriculography rather than on multiple bur holes for the recognition of small or aberrantly located clots.

Even when a clot is disclosed on the side first explored, a bur hole should be made on the opposite side. Fourteen patients in this series had bilateral hematomas. When a hematoma is not found on the side first explored, then the other side must always be explored. Reference has already been made to the frequency of false localizing signs. In this series homolateral hemiparesis or pyramidal tract signs occurred in 17 per cent of the total number of cases with such neurologic signs. Failure to explore the second side resulted in overlooking the hematoma in 1 case in this series. Necropsy two days later revealed the clot. This patient had a homolateral hemiparesis, and the case was one of those encountered early in my experience.

After the dura is opened evacuation of the hematoma is readily accomplished in most cases. With the head postured as described, most of the liquid hematomas will escape by gravity as soon as the dura is opened and the neomembrane of the hematoma is ruptured. If the clot is solid or semisolid, simple alternate irrigation with isotonic solution of sodium chloride and suction through a catheter passed beneath the dura will serve to break it up. Irrigation with isotonic solution of sodium chloride must be resorted to cautiously or not at all in acute cases because it induces swelling of the brain, which is often already present. In the chronic cases there is often difficulty in getting the brain to expand, and repeated irrigations appear to be of value in attaining that objective.

Occasionally the primary bur hole is at the edge of the clot, or difficulty is experienced in breaking up a relatively solid clot. Should this occur, additional bur holes may be placed over the center of the now localized clot or at its other edge, and through and through irrigation used. This was done in 2 cases. As already mentioned in 2 other cases, an osteoplastic craniotomy was used to evacuate an organized or solid clot.

In older persons, and especially in patients who come to the surgeon late, one occasionally finds that the cerebral hemisphere does not expand to fill the space formerly occupied by the clot. Trotter [2] noted this in the 2 fatalities that he reported. Both Grant [24] and Coleman [25] in 1935 called attention to the grave prognostic value of this observation. Cohen [26] reported a remarkable and much quoted case of this type in which the patient finally recovered after repeated aspirations of the subdural space. In my experience these cases all terminated fatally, in spite of drainage of the subdural space and the intravenous administration of hypertonic fluids in an attempt to swell the brain. Munro [5] quoted Henschen as recommending, in 1930, the administration of distilled water intravenously to swell the contracted brain in such cases.

In 1941, I reported a technic which has been regularly used since, when at the operating table the brain fails to expand to occupy the space previously occupied by the hematoma. The subdural space is filled with distilled water and a small soft rubber drainage tube is led out of the subdural space. The wound is then closed in layers tightly about the tube. A clamp is placed on the tube, the head is dressed and the patient is returned to bed. He is given 1,000 cc. of distilled water intravenously and another 1,000 cc. of isotonic solution of sodium chloride. The clamp is removed from the tube four to six hours later, and the tube is removed twenty-four hours later.

The danger of hemolysis after the intravenous administration of distilled water is obvious. The patients all exhibit mild hemoglobinuria for a day or two after the injection, but other ill effects have not been observed clinically. The use of this procedure is justified by a comparison of the previous poor result constantly encountered in this type of case with the successful result of this technic. It has now been used in 16 patients. All recovered with 1 exception; in this patient the technic was modified by the omission of the intravenous administration of distilled water; only isotonic solution of sodium chloride was given intravenously. This patient followed the usual course of such cases in past experience; he failed to rally, remained in coma and died forty-eight hours later. It is felt that this technic has now been used sufficiently often to demonstrate its value.

TABLE 4.—*Classification of Lesions and of Mortality of Patients*

	Hematomas		Cerebral Injury	
	Unilateral	Bilateral	Associated	None
Total	86	14	29	71
Recovered	80	10	10	60
Dead	26 (31%)	4 (29%)	19 (66%)	11 (15%)

A careful study of the results with different sizes of clot was made. Twenty-four clots were classified as small, 3 to 10 mm. thick (clots less than 3 mm. thick were not included in this series) and not over an estimated 30 cc. in volume. Forty-nine hematomas were considered moderate in size, 1 to 2 cm. thick or 30 to 60 cc. in volume. Twenty-seven patients had large hematomas, 2 cm. or more thick. There was no essential difference in the mortality in these groups. It is apparent, as previously stated, that the age of the patient and the stage of the clot (tables 1 and 2) are of importance in determining mortality. Table 4 shows that whether the clot is unilateral or bilateral is likewise unimportant, but that the factor of associated injury to the brain is most important of all. Associated injury to the brain here means gross cerebral contusion or laceration noted at operation or necropsy. Since exploration was limited in most cases to openings 1 to 3 cm. in diameter over each parietal region, it is likely that many surviving patients had injury to the brain that was not revealed at operation. Since associated injury to the brain is generally seen in acute cases, the reason for the high mortality in that group is

24. Grant, F. C.: Chronic Subdural Hematoma, J. A. M. A. **105**: 845-849 (Sept. 14) 1935.
25. Coleman, C. C.: Chronic Subdural Hematoma, Am. J. Surg. **28**: 341-363, 1935.
26. Cohen, J.: Chronic Subdural Accumulations of Cerebrospinal Fluid After Cranial Trauma, Arch. Neurol. & Psychiat. **18**: 709-723 (Nov.) 1927.

obvious. It can be seen from tables 2 and 4 that the mortality for patients operated on a week or longer after the injury was only 14 per cent and that for patients without associated cerebral injury was only 15 per cent. The correlation is obvious.

SUMMARY

Subdural hematoma is, as a rule, primarily caused by injury to the head. Occasionally, such predisposing causes as tumor or a vascular anomaly are seen. The initial hemorrhage is subdural rather than intradural.

If the immediate hemorrhage is massive, there is usually a severe associated injury to the brain and corresponding severity of symptoms. The mortality is high in this group, and surgery is only rarely of value. If the patient survives the injury to the brain these hemorrhages are generally absorbed because of their communication with the subarachnoid space through tears in the arachnoid.

Moderate or small primary subdural hemorrhage gradually grows by osmosis of cerebrospinal fluid through the arachnoid. The hematomas gradually develop neomembranes, first on the dural side.

Diagnosis is based on a history of trauma (if available) and on the progressive nature (often with fluctuation) of the symptoms. Examination of the spinal fluid is extremely important. In the last analysis the diagnosis is established by exploratory bur holes.

Exploration should always be bilateral. Drainage is usually possible through a single bur hole; occasionally multiple bur holes or an osteoplastic flap is necessary. If during surgical intervention the brain does not expand to fill the space previously occupied by the clot, special measures such as the satisfactory procedure described herein to induce such expansion should be instituted.

ABSTRACT OF DISCUSSION

Dr. A. W. Adson, Rochester, Minn.: I should like to comment on some of the sequelae that develop in connection with subdural hematoma. Dr. Voris has explained that there are a number of patients who come with symptoms of increased intracranial pressure, with or without definite neurologic observations. The patient may show evidence of papilledema, and naturally one suspects the presence of a brain tumor. It is true that after one uncovers the finding at operation one will elicit some story that reveals a mild accident or head injury. I recall a young man who was blowing a large tuba horn and subsequently developed headache. He came to me several months later. Exploration for brain tumors have been done on a number of these patients. A subdural hematoma of some duration has a membrane both on the dural side and on the arachnoid side. As one palpates this membrane one becomes aware of the fact that one is dealing with a fluid mass. Some patients have a refilling of this cavity when an attempt has been made to wash out the blood clot by irrigation. I think that is due to the fact that the blood has not all become liquefied, and there remains a fairly good sized clot along the edge. Because this remains, more osmosis takes place and the recurrence might follow. Therefore it is rather important to make sure that this cavity has been thoroughly irrigated and that all the blood clots have been removed. If one has occasion to turn a bone flap it is wise to attempt to remove the membrane, because in so doing one undoubtedly relieves the restraining effect which sometimes prevents the refilling of the brain itself. I had a patient who apparently recovered from the washing out and draining of the subdural blood and returned later with a brain abscess and also an abscess in this cavity between the arachnoid and the dura. In the treatment of these cases my associates and I have used a solution of penicillin. We have attempted to drain the abscess and then fill the cavity. If, however, a brain abscess has developed in connection with the old subdural clot, one of course treats it in the usual manner. It is not uncommon, if there is occasion to open up one of these with a bone flap, to find a white, raised mass, due undoubtedly to the collection of fibrin white cells and other structures in the blood, so that again I want to emphasize that it is extremely important to clean out all the old blood or any white clot that may be present. If one has occasion to open the skull, the membrane as well as the old blood should be removed.

THE MANAGEMENT OF BACTERIAL INFECTIONS OF THE SKIN

DONALD M. PILLSBURY, M.D.
Philadelphia

Bacteria play roles of varying importance in a wide variety of diseases of the skin in man. The problem of the management of bacterial infections of the skin cannot be dismissed simply by a discussion of the diseases produced, the bacteria concerned and the advantages and disadvantages of the various antibacterial agents now available, especially since the latter still have certain definite shortcomings. The management of the more difficult and more resistant cutaneous infections can be improved by a better understanding of the manner in which the skin resists and harbors bacteria and of some of the mechanisms by which bacteria produce harmful effects.

The experience of the Army Medical Corps during recent years has furnished much information in regard to the potentialities of cutaneous diseases in the production of disability in young male adults. The amount of disability from this source was surprisingly large, and various types of pyoderma were responsible for much of it. The overall experience of the Army in this regard has recently been summarized by Pillsbury and Livingood.[1] During the year 1944, the number of hospital admissions because of diseases of the skin varied between 3,731 and 10,399 for each 100,000 troop strength in different theaters of operation. These figures do not include admissions to the sick list in field medical stations or dispensaries, in which the number of dermatologic patients varied between 15 and 60 per cent of the total.

In troops in the United States, the average number of hospital admissions by reason of a cutaneous disease was 42 per thousand troop strength per year, while in overseas stations the average number was almost twice as great, or 80 per thousand troop strength per year. Patients who were returned from an overseas station because of a cutaneous disease had a total hospital stay averaging 5.5 months, as long as that for many major battle casualties or serious medical diseases. In the Southwest Pacific area, between November 1944 and November 1945 approximately 15 per cent of all patients evacuated to the United States were sent home because of a cutaneous disease. In some months this was the most common reason for evacuation, with

From the Department of Dermatology and Syphilology, University of Pennsylvania Medical School.

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Because of lack of space, this article is abbreviated in The Journal by omission of portions of the text and footnotes. The complete article will appear in the author's reprints.

1. Pillsbury, D. M., and Livingood, C. S.: Experiences in Military Dermatology: Their Interpretation in Plans for Improved General Medical Care, Arch. Dermat. & Syph., to be published.

the exception of neuropsychiatric disorders; and in all months it was a more frequent cause of evacuation from that area than battle casualties.

Pillsbury and Livingood state that some form of pyoderma was regularly among the first five sources of disability from cutaneous disease, and that "cutaneous pyogenic infections are a far more important cause of chronic disabling eruptions than are superficial fungous infections."

Certain striking advances in the treatment of cutaneous infection have been made during recent years, but unfortunately a nonsensitizing and completely satisfactory method of treatment is not yet available. In particular, local penicillin therapy is producing contact dermatitis in an increasing percentage of patients, and further study of the mechanism of this reaction and of means to prevent it is needed.

CLASSIFICATION OF CUTANEOUS INFECTIONS

In the selection of the proper type of treatment, division of cutaneous infections into certain broad classifications is useful. Some infections are acute and primary, arising rapidly in skin which was previously normal. Other infections are acute and secondary, arising in skin which has had its integrity disturbed by some previous disease or injury. Other infections are chronic and recurrent, at times presenting great difficulties in cure. The following practical classification has proved useful.[2] In it, certain complex descriptive dermatologic terms have been omitted because they are more confusing than informative.

Primary Acute Superficial Infections.—Primary acute superficial infections include impetigo of various types, acute infectious eczematoid dermatitis and superficial acute ecthyma. Hemolytic Staphylococcus aureus and/or streptococci (ordinarily Lancefield group A) are concerned in the causation of such eruptions. The character of the lesions varies considerably, depending on the virulence of the bacteria concerned, the defensive reaction of the skin to infection and the site of involvement, whether on smooth skin, about hairs or in intertriginous areas. Factors such as perspiration (for instance, in tropical impetigo), functional or organic disturbances of the circulation and seborrheic "diathesis" greatly influence the character and course of the infection.

Acute Superficial Infections Occurring as a Complication of Some Preexistent Dermatosis.—Bacterial infection may appear as a complication of a wide variety of dermatoses, but in the following diseases it is most frequently observed: dermatitis and eczema, superficial fungous infections, seborrheic dermatitis, parasitic diseases and neurodermatitis. Bacteria rapidly gain a foothold in skin which is already diseased, and the problem of their removal is complicated by the fact that such skin reacts more frequently to treatment than does skin which was previously normal. Concomitant treatment of an underlying dermatosis, for instance, scabies or seborrheic dermatitis, may be necessary before the bacterial infection can be controlled completely. It is of the greatest importance that secondary bacterial infection of any eruption be recognized and controlled as promptly as possible, if chronicity of the infection is to be prevented.

Chronic Eczematous Lesions in Which Pyogenic Infection is Playing a Variable but Significant Role.—The chronic eczematous lesions in which pyogenic infection is playing a variable but significant role have certain characteristics in common, but may vary considerably in appearance and localization. The features in common are (1) eczematous appearance, often with little evidence that bacterial infection is present; (2) sharp circumscription of each particular individual lesion, usually; (3) chronicity; (4) occasional acute pyogenic flare-ups, of variable intensity; (5) a definite tendency of the patient to be hypersensitive to various bacterial derivatives, particularly staphylococcus toxoid, and (6) liability to explosive dissemination of the process to other parts of the cutaneous surface, sometimes with an accompanying systemic reaction. Lesions of this group of eczematous dermatoses are most frequently observed on the lower legs, the forearms and the hands. They are variously diagnosed, with reason, as nummular eczema (an unsatisfactory descriptive term), seborrheic dermatitis, chronic eczematoid dermatitis, chronic contact or food dermatitis and neurodermatitis.

Chronic Deep Ulcers.—While bacterial infection is often chiefly responsible for chronic deep ulcers, thorough general medical study of the patient is absolutely essential to the intelligent management of any chronic ulcer. In addition, the bacteriologic study of the lesion should be especially thorough, with culture by both aerobic and anaerobic methods. Such patients should never be treated with penicillin by injection until the result of the serologic test for syphilis is known, or, at least, blood has been taken for it.

Acute and Chronic Infections of the Skin Appendages.—Acute and chronic infections of the pilosebaceous apparatus and the sweat glands (folliculitis, furunculosis, carbunculosis, hidradenitis) are often extremely difficult to cure, and a combination of medical, surgical and radiotherapeutic methods may be necessary. Relapses are commonly seen, and thorough study to determine what factors other than infection are operative is often necessary.

Other infections of the skin and subcutaneous tissue include cellulitis, both acute and recurrent, erysipelas, erysipeloid of Rosenbach, venereal diseases and cutaneous diphtheria. Discussion of the management of these infections will not be attempted in this paper.

BACTERIOLOGIC AND THEORETIC CONSIDERATIONS

Certain established facts and hypotheses in regard to the bacterial flora of the normal and diseased skin are of considerable practical value in the management of acute and chronic cutaneous infections. The important general principles are:

1. *The Number of Bacteria on Normal Skin.*—The human skin is the habitat of an enormous number of bacteria, which vary to a considerable degree in kind and number in different persons, in various parts of the body and under different conditions of environment, hygiene, apparel, perspiration and contaminating bacterial contact.

A method for determining the number of bacteria on the hands and forearms has been devised by Price,[3]

2. Pillsbury, D. M.: Sulfonamides in Dermatology, Brit. J. Dermat. **56**: 68, 1944.

3. Price, P. B.: The Bacteriology of the Normal Skin: A New Quantitative Test Applied to a Study of the Bacterial Flora and the Disinfectant Action of Mechanical Cleansing, J. Infect. Dis. **63**: 301, 1938.

which has proved useful in determining the effects of mechanical "degerming" of the skin and of various antiseptics. This method has been employed, with some modifications, in several studies by other workers (Pohle,[4] Pillsbury,[5] Cromwell,[6] Shaffer[7] and their associates).

The number of bacteria removable from the hands and forearms of normal persons by a standard series of scrubs of a total duration of fifteen minutes has varied between 4 million and 40 million in my experiments.[5] The number of bacteria shows great variation from person to person and is influenced greatly by hygiene, particularly of the nails, by the wearing of rubber[3] or other gloves which produce increased warmth and perspiration, by contact with infected patients and by covering the skin with a relatively impermeable film, such as calcium soap.[8]

2. *Types of Bacteria on Normal Skin.*—The types of bacteria recovered from normal skin show considerable variation. The concept of Price that cutaneous bacteria may be divided into a transient and resident flora is of great practical value, although the division is sometimes not clear-cut. The transient bacteria are easily removed from the skin by a variety of means, but the resident bacteria are difficult to kill or remove. In particular, it has been demonstrated that pathogenic bacteria and fungi may suddenly become part of the resident flora and may persist for a long time.

Beta hemolytic streptococci, particularly those of the Lancefield[11] group A, are infrequently isolable from the normal human skin unless the subject is suffering from an infection elsewhere. Staphylococci are, however, frequently recovered, though coagulase-positive hemolytic Staph. aureus is found with far greater frequency on the frankly infected or eczematous skin than on normal skin.

3. *Cutaneous Self-Disinfection.*—The normal skin has an enormous power for self disinfection, the mechanism of which is not yet clearly understood. Burtenshaw[13] has recently reviewed this subject. He concluded that while such factors as desquamation, desiccation, acidity and sunlight contribute to the self-sterilizing powers of the skin, they do not adequately explain its capacity in this regard. In his opinion, it is probable that the whole range of fatty acids of the acetic series, from formic to stearic and oleic, and a few other organic acids are important agents in killing bacteria, fungi and viruses on the surface of the skin.

4. *The Factor X in Cutaneous Infection.*—It has been established by experiments on the human skin that it is often difficult to produce infection by the introduction of bacteria or infectious material derived from a patient suffering from a cutaneous infection.[14] This difficulty has been well demonstrated in impetigo, which is presumed to be almost entirely due to the action of bacteria and to be highly contagious. The most recent experimental studies in this regard have been carried out by Bigger and Hodgson[15] and by Sheehan and Fergusson.[16] The former attempted to produce impetigo of the skin of volunteer subjects and of the unaffected skin of patients with impetigo by various means, without success. Sheehan and Fergusson were slightly more successful in producing impetigo experimentally.

It is difficult to escape the conclusion that, as Bigger and Hodgson have pointed out, there is a factor X in the development of impetigo. The disease varies in contagiousness from the persistent epidemics which were formerly encountered in nurseries for the newborn to the relative infrequency with which impetigo is encountered among adults, such as physicians and nurses, who are repeatedly exposed to the disease.

5. *Superficial Bacterial Infection as a Sensitizing Agent.*—The potentialities of superficial bacterial infection as a sensitizer of the skin are manifold. The bacteria of the skin in patients with chronic eczema are almost always a significant component in the variable etiologic backgrounds of such conditions. Stokes[18] has long been interested in this problem and has written a number of papers dealing with different aspects of the "infection-allergic complex." He and others have demonstrated that in the course of almost any chronic eczematous disease, ingestant, inhalant, contactant, infective, general medical and psychosomatic influences are frequently interwoven and variously predominant. With the employment of this useful concept, it is at once apparent why any one of these various methods of approach to the problem of chronic eczematous eruptions is useful and often successful, at least temporarily.

It is of interest to examine some of the evidence concerning the mechanisms by which bacteria may contribute to exacerbation or persistence of eczematous disease. As has been stated previously, skin that is chronically inflamed almost inevitably receives some new strains of bacteria into residence. At times these may quickly produce acute, severe infections. Examples of this include the explosive impetigos and infectious eczematoid dermatitis occasionally seen in patients with atopic dermatitis. Another example is the persistent furunculosis which sometimes follows dermatitis or scabies. The furunculosis often persists long after the original dermatosis has disappeared.

On the other hand, bacteria which become resident in inflamed skin frequently do not produce overt evidences of infection but may impede the progress of the skin to normality by acting as potent skin sensitizers. One strong clinical evidence of this is the frequency with which patients react to injections of staphylococcus toxoid or of a preparation of staphylococcus toxoid and bacterial antigen. Evidence of this

4. Pohle, W. D., and Stuart, L. S.: The Germicidal Action of Cleansing Agents: A Study of a Modification of Price's Procedure, J. Infect. Dis. **67**: 275, 1940.

5. Pillsbury, D. M.; Livingood, C. S., and Nichols, A. C.: Bacterial Flora of the Normal Human Skin: Report on the Effects of Various Ointments and Solutions, with Comments on the Clinical Significance of the Study, Arch. Dermat. & Syph. **45**: 61 (Jan.) 1942.

6. Cromwell, H. W., and Leffler, R.: Evaluation of "Skin Degerming" Agents by a Modification of the Price Method, J. Bact. **43**: 51, 1942.

7. Pillsbury, D. M.; Shaffer, B., and Nichols, A. C.: Bacterial Flora of Normal Skin: A Study of the Effect of Sulfathiazole and Some Ointment Bases, J. Invest. Dermat. **5**: 371, 1942.

8. Jones, K. K., and Lorenz, M.: Relation of Calcium Soaps to Staphylococcal Infections of the Skin, J. Invest. Dermat. **4**: 69, 1941.

11. Lancefield, R. C.: Specific Relationship of Cell Composition to Biological Activity of Hemolytic Streptococci, in Harvey Lectures, 1940-1941, Lancaster, Pa., Science Press Printing Company, 1941, pp. 251-290.

13. Burtenshaw, J. M. L.: Self-Disinfection of the Skin: A Short Review and Some Original Observations, Brit. M. Bull. **3**: 161, 1945.

14. Greenbaum, S. S.: Phagedaena Geometrica (Brocq), Arch. Dermat. & Syph. **43**: 775 (May) 1941.

15. Bigger, J. W., and Hodgson, G. A.: Impetigo Contagiosa: Its Cause and Treatment, Lancet **1**: 544, 1943.

16. Sheehan, H. L., and Fergusson, A. G.: Impetigo: Aetiology and Treatment, Lancet **1**: 547, 1943.

18. Stokes, J. H.: Fundamentals of Medical Dermatology, Philadelphia, University of Pennsylvania, 1942. Stokes, J. H., and Kulchar, G. V.: The Infection-Allergic Complex in Arsphenamine Dermatitic Reactions with Special Reference to Dermatophytosis, Brit. J. Dermat. **46**: 134, 1934.

sensitivity may be seen in a decided local reaction at the site of intradermal injection of a small amount of toxoid, or by an exacerbation of the dermatitis after such an injection or even by the precipitation of a generalized id reaction. The latter reaction may sometimes be accompanied by evidence of systemic reaction. Similar reactions may be elicited at times by the injection of simple vaccines of staphylococci or streptococci isolated from the skin of the patient, though not as frequently as with a stock staphylococcus toxoid, in my experience.

While one must be cautious in interpreting such sensitivity as having been directly induced by the growth of bacteria in an area of damaged skin, there is some experimental evidence that this is actually the case. Hecht and others [19] have shown that under certain conditions, persons may become sensitized to the slightly denatured substances of their own organs, and that organ-specific antibodies may then be produced. The antibody may, in turn, damage the particular organ in vivo and in situ and may thus produce clinical disease. These investigators injected sections of rabbit skin intramuscularly at one site and staphylococcus toxin intradermally at other sites. The injected rabbits developed percipitins against soluble rabbit skin antigen. However, in animals injected with skin alone or toxin alone and in untreated controls anti-skin precipitins were not observed.

THE CLINICAL MANAGEMENT OF PYODERMAS

One principal aim in the treatment of any bacterial infection is, obviously, to eliminate the offending bacteria as rapidly as possible. It is equally obvious, however, that the treatment must be of an order which will not produce a reaction which may be more severe or persistent than the original disease. In the treatment of acute superficial infections such as impetigo, ecthyma and infectious eczematoid dermatitis, it is usually possible to cure the disease within a period of a week. Until recently it was believed that topical penicillin therapy was the initial treatment of choice, but the disturbing appearance of an increasing incidence of sensitivity reactions in patients so treated is producing a considerable change in this view. It is probable that further experience will indicate that topical penicillin therapy is much less safe, and therefore less useful, than was previously believed.

In the following paragraphs, the various types of treatment of bacterial infections of the skin in common use at the present time will be outlined, together with comments on their usefulness. Evaluation of certain older methods of treatment is difficult, because adequate data, including follow-up results, have never been collected in regard to many of them, to my knowledge.

Topical Penicillin Therapy.—A large number of reports on the topical penicillin method of treatment have appeared since it came into general use in the armed forces in 1944. Two particularly outstanding studies have been made, one by Davies and his associates [23] under the auspices of the Royal Army Medical Corps and the other by Hopkins and Lawrence [24] at the instance of the Surgeon General, United States Army. Davies treated 182 patients affected with various types of superficial pyoderma with penicillin applied topically. Careful bacteriologic studies were performed throughout the study with, of particular interest, grouping of the streptococci recovered according to the Lancefield classification. The distribution of patients treated was as follows: annular impetigo (staphylococcic) 17, impetigo (streptococcic) 12, ecthyma 15, furunculosis 6, impetiginous seborrheic dermatitis 132.[25]

The penicillin in this study was ordinarily applied by means of an aqueous solution containing 1,000 units per cubic centimeter which was sprayed on the skin at intervals of four hours. In both staphylococcic and streptococcic impetigo, penicillin spray produced more rapid healing than a control treatment, by an average of 4.6 days. It was concluded that it was a superior method of treatment in such cases. The results in ecthyma were not considered superior to other methods of treatment. In impetiginous seborrheic dermatitis, penicillin spray was occasionally, but not always, more effective than other methods.

It is noteworthy that the Davies workers were usually able to recover the original bacteria from the lesions after penicillin therapy, and this has been confirmed by the study of Hopkins and Lawrence. Davies and his associates encountered no instances of reactions attributable to a sensitivity to penicillin in their cases. This is at variance with recent other studies, and with my own experience in studies made with Templeton,[26] Wrong,[27] Gottschalk [28] and other associates.

Hopkins and Lawrence [24] treated a series of 618 soldiers suffering from various types of pyogenic infections by local applications of penicillin incorporated in three types of bases, in strengths varying from 100 to 10,000 units per gram. The bases used were an oil-in-water emulsion (U. S. Army supply item no. 1173800), a bentonite gel, and a glycol-carbowax mixture. Apparently these bases were equally satisfactory. A strength of 100 units per gram was inferior to a strength of 500 units per gram. Occasionally, higher concentrations of penicillin were necessary, but these concentrations produced an increased incidence of sensitization to penicillin.

Hopkins and Lawrence concluded that topical penicillin therapy is rapidly effective in the majority of cases of impetigo, ecthyma and the pyogenic complications of dermatophytosis. In the latter condition, the incidence of control of the infection was higher, and the time required to attain it less, than in lesions which were treated with 5 per cent sulfathiazole, 10 per cent tannic acid, 20 per cent zinc peroxide or 0.5 per cent benzolkonium chloride solution. It is noteworthy also, in passing, that rest and protection of the inflamed skin by a simple dressing were as effective as penicillin therapy in a small series of cases of mildly infected dermatophytosis of the feet.

19. Hecht, R.; Sulzberger, M. B., and Weil, H.: Production of Antibodies to Skin by Means of Synergistic Action of Homologous Skin Antigen and Staphylococcus Toxin, J. Exper. Med. **78**: 59, 1943.

23. Davies, J. A. T.; Dixon, K., and Stuart-Harris, C. H.: Therapeutic Trial of Penicillin in Infective Conditions of the Skin, Quart. J. Med. **14**: 183 (Oct.) 1945.

24. Hopkins, J. G., and Lawrence, H.: Penicillin Therapy in Pyogenic Dermatoses, New York State J. Med., to be published.

25. The concept of seborrheic dermatitis as employed in this and many other papers appearing in the British medical literature is considerably more elastic than the usual American concept of this disease. Many of the cases reported would be regarded by American observers as instances of superficially infected intertrigo, patchy eczematoid dermatitis, neurodermatitis or nummular eczema.

26. Templeton, H. J.; Lunsford, C. J., and Allington, H. V.: Reactions to Penicillin, Arch. Dermat. & Syph., to be published.

27. Wrong, N. M.: Penicillin in Pyoderma, Canad. M. A. J., to be published.

28. Gottschalk, H. R., and Weiss, R. S.: Epidermal Sensitivity to Penicillin, Arch. Dermat. & Syph. **53**: 365 (April) 1946.

The results of topical penicillin therapy in folliculitis of the beard were not striking; the infections of only one third of the patients were cleared up, even temporarily. In secondarily infected eczematous dermatitis, the bacterial infection was controlled in 40 per cent of the cases, but sensitization to penicillin was encountered in 25 per cent of the cases. Hopkins and Lawrence observed that penicillin was seldom effective against seborrheic dermatitis, intertrigo, folliculitis of the trunk extremities, or acne.

Sensitivity to Penicillin Applied Locally.—Hopkins and Lawrence found an overall percentage of sensitivity of 11 per cent; the highest number of reactions occurred in eczematoid dermatitis and the lowest in impetigo, ecthyma and secondarily infected dermatophytosis. Wrong [27] states that "my impression is that the incidence of dermatitis is increasing by leaps and bounds and is well over 10 per cent at present." Gottschalk and Weiss [28] found that 24 of 200 persons who apparently had had no previous contact with penicillin gave a positive reaction to the initial patch test. In addition, by means of a patch test they were able to sensitize 4.5 per cent of 200 persons to penicillin ointment.

Templeton, Lunsford and Allington [26] have cited a long list of published reports of local reactions to penicillin, which have occurred in physicians and chemists handling the drug, after the application of a wet dressing of penicillin and after the use of penicillin lozenges and troches and penicillin eye drops. I have observed instances of all these reactions, particularly of the sensitivity which develops in physicians, nurses and corpsmen who are frequently exposed to penicillin.

Fortunately, the local reactions to penicillin are usually mild and subside promptly. In addition, it is possible for some patients to continue the use of penicillin locally with disappearance of the sensitivity, a process which has a well known corollary in the "hardening" of the skin which occurs in workers exposed continuously to occupational contactants. On the other hand, the swelling, redness and vesiculation may at times be decided and may require prompt discontinuance of the penicillin therapy. Two extremely important considerations, both of which have had a disappointing corollary in the case of local sulfonamide therapy are, first, it is probable that as more persons are repeatedly exposed to contact with penicillin by application or injection, the incidence of severe reactions will increase; second, it is probable that sensitivity of the epiderm induced by local application will be succeeded in some patients by induced sensitivity of the dermal and vascular structures, with the result that reactions will follow the subsequent parenteral administration of penicillin.

Sulfonamide Therapy in Superficial Pyoderma.—Local sulfonamide therapy of superficial infections of the skin is rarely justifiable; some observers believe that it has no place whatever in modern therapy. In the clinic with which I am associated, the initial results with local sulfathiazole therapy were excellent, and almost no untoward reactions of any severity were seen in the first 200 patients treated.[29] Many observers, including myself,[30] then began to perceive reactions of severity and chronicity if the sulfonamide preparation had been used for prolonged periods, particularly in cases of eczematous pyoderma. During the war, 5 per cent sulfadiazine in an emulsion base was extensively used on soldiers for various superficial infections. If used properly for acute primary infections for periods not longer than five days it did relatively little harm, but it was all too frequently applied for prolonged periods without medical control and with disabling results for the patient. It is impossible to restrict the use of an easily available ointment preparation sufficiently to prevent its misuse by the patient or by others.

Local Hygiene.—The cleaning up and gentle débridement of superficial cutaneous infections is an absolute *sine qua non* to the maximum effectiveness of any method of treatment. It is as important to open a pustule or remove epithelial debris gently as it is to drain a deep abscess, in terms of prompt cure of the infection. Various solutions are fairly effective in promoting this cleaning up process, not through any particular antibacterial power, but because they soften debris and allow the immune response of the skin and the action of other treatment to proceed effectively. Isotonic solution of sodium chloride, boric acid solution and 0.01 per cent potassium permanganate solution are all useful. In recent laboratory experiments, none of these substances had any rapid adverse effect on penicillin solution in the strengths ordinarily employed.

Rest and exposure of the affected part to air are also important features of treatment. It is difficult to cure a secondary infection of the foot, however mild, when the patient encases his foot in a shoe and subjects the foot to trauma for twelve to eighteen hours a day.

Penicillin by Injection.—In recent months, it has been my practice to employ penicillin by injection in superficial pyodermas, whenever this procedure is possible. If the infection is acute and caused by penicillin-sensitive bacteria, such therapy is almost always rapidly curative. This treatment has serious disadvantages by reason of the expense involved, but this is not a medical reason. If penicillin in water or isotonic solution of sodium chloride is employed, treatment is inconvenient, but treatment may be carried out in the office with penicillin in peanut oil and beeswax solution. Two or three daily injections of 150 thousand to 300 thousand units each are ordinarily sufficient. Whether or not the incidence of severe reactions to penicillin administered parenterally will prove a significant drawback to such treatment remains to be seen, but at present it is my experience that the parenteral injection of penicillin is equal or superior to topical penicillin therapy in the treatment of superficial cutaneous infections and is productive of fewer reactions.

Various Other Methods of Treatment.—Ammoniated Mercury: The use of an ointment which contains ammoniated mercury in a strength above 5 per cent is rarely necessary. In many patients, particularly if there is much oozing from the lesions or if the skin is oily, a suspension of ammoniated mercury in a "shake" lotion, such as calamine, is superior to the ointment.

29. Pillsbury, D. M.; Wammock, V. S., and Nichols, A. C.: The Local Treatment of Pyogenic Cutaneous Infections with Sulfathiazole in an Emulsion Base, Am. J. M. Sc. **202**: 808, 1941.

30. Livingood, C. S., and Pillsbury, D. M.: Sulfathiazole in Eczematous Pyoderma: Sensitization Reaction to Successive Local and Oral Therapy, J. A. M. A. **121**: 406 (Feb. 6) 1943.

Gentian Violet Medicinal: Gentian violet medicinal is widely used, but it is messy and disfiguring.

Acriflavine: Acriflavine is expensive and messy but often extremely effective. It is best applied in compresses of 0.01 per cent strength. Its use in conjunction with sulfonamides may produce an increased tendency to sensitivity to sunlight.[32]

Castellani's Carbol Fuchsin Paint: Castellani's carbol fuchsin paint is often the single most effective local application in chronic low grade eczematous infections of the skin. It is disfiguring in color but not as messy as gentian violet medicinal. It is decidedly antipruritic, and local irritation from it is not encountered as frequently as might be expected from the strength of phenol and resorcinol in the compound.

Silver Nitrate: Silver nitrate may be used in compresses of 0.1 per cent strength or painted on in 1 per cent aqueous solution. It is an extremely useful drug in superficial infections and almost reactionless, unless excessive strengths are used. It is important to apply the solution as directly as possible to the site of infection, not merely on top of crusts and epithelial debris.

Quinolor Compound Ointment: Quinolor Compound Ointment[33] is particularly useful in chronic follicular infections, though often effective in other pyodermas. It occasionally produces some burning when applied, though severe local reactions to it are uncommon.

Benzalkonium Chloride Solution (0.5 per cent): Benzalkonium chloride solution (0.5 per cent) is a soothing, apparently reactionless, compound which has had extensive use by Hopkins and Lawrence. Ordinarily, however, it is not sufficiently antibacterial alone for effective use against acute infections.

Other preparations are recommended, but those already mentioned have been the most useful in my experience. It cannot be emphasized too strongly that the use of chemical irritants or of highly sensitizing compounds on infected, inflamed skin will result in severe reactions, and in many instances may lead to prolongation of partial disability over a period of weeks or months. Instances of this are regularly seen. In particular, tincture of iodine should never be used; it is a cauterant and skin-sensitizer, and too frequently adds to the burden under which the diseased skin is already laboring.

SUGGESTED TREATMENT REGIMENS[34]

Suggested Treatment Against Impetigo, Ecthyma, Acute Infectious Eczematoid Dermatitis, and Acute Pustular Folliculitis.—1. Thorough gentle cleaning of the involved site by means of soap and water, compresses of isotonic solution of sodium chloride or 0.1 per cent potassium permanganate solution for twenty minutes two to six times a day, gentle mechanical opening of all pustules and careful removal of softened cutaneous debris are of importance.

2. Penicillin therapy is recommended. It is my opinion that penicillin by injection, especially in vehicles designed to slow the absorption and maintain an adequate serum concentration of the drug for twelve to twenty-four hours, is probably preferable to local penicillin therapy. The dose for adults should be of the order employed for any acute bacterial infection. If the penicillin oil and beeswax mixture is used, a single injection of 1 cc. which contains 300,000 units of penicillin once a day is ordinarily adequate. However, in simple impetigo, for instance, local penicillin therapy is much simpler and less expensive. The total period of application should not be longer than five days, even at the risk of relapse. No more ointment than can be used efficiently during this time should be prescribed. A concentration of 500 units per cubic centimeter or gram is best, though in all-grease vehicles, a higher concentration may be necessary to allow sufficient diffusion of penicillin to the site of infection. The penicillin may be applied four or five times a day in an aqueous spray or compress, in various types of emulsion bases (including "brushless shaves") and in all-grease bases. Theoretically a solution or emulsion base should be most effective, though clinical studies do not confirm this entirely. Emulsion bases allow reduction in the penicillin content on standing, but are sufficiently potent for at least a week at room temperature. All-grease bases show no significant deterioration on standing. An adequate dressing should be used on ecthyma lesions.

3. If local penicillin therapy is not observed to produce improvement within seventy-two hours, a change to something else is advisable. Ammoniated mercury, silver nitrate, alibour water and Quinolor ointment, in that respective order, are the best alternatives, in my experience.

Suggested Treatment of Acute Secondarily Infected Dermatitis, Eczema, Dermatophytosis, and Similar Lesions.—1. Penicillin should not be applied locally, except possibly in secondarily infected dermatophytosis; parenteral injection of penicillin is the treatment of choice. The most commonly encountered reaction will be an inflammatory reaction at the site of the active or quiescent fungous infection, or a dermatophytid-like reaction.

2. Bacterial cultures and determination of the sensitivity to penicillin of the bacteria recovered should be performed whenever possible.

3. Sulfonamides should not be applied locally.

4. Undue activity and trauma of the affected part by shoes or clothing should be avoided so far as possible.

5. Nonirritating mildly antiseptic soaks or compresses are useful. These may be used frequently, but the diseased skin should have adequate exposure to the air several times a day. Gentle mechanical débridement of the affected site, taking care not to injure underlying or surrounding skin, is important.

6. If penicillin is not promptly effective (within seventy-two hours), a change to a sulfonamide compound (sulfadiazine and/or sulfamerazine) administered by mouth should be considered, along with a change

32. Peterkin, G. A. G.: Sulfonamide Rashes: An Analysis of Five Hundred Cases Seen in North Africa and Italy, Brit. M. J. **2**: 1 (July 7) 1945.

33. Quinolor Compound Ointment, E. R. Squibb & Sons, contains 10 per cent benzoyl peroxide and 0.5 per cent Quinolor (a mixture of 3 chlorine derivatives of 8-hydroxyquinoline) in a base of equal parts of petrolatum and wool fat.

34. Since this paper was written, MacKee and others (MacKee, G. M.; Sulzberger, M. B.; Herrmann, F., and Karp, F. L.: The Treatment of Pyodermas with an Interface Active Solution of Tyrothricin, J. Invest. Dermat. **7**: 4 [Aug.] 1946) have reported favorable clinical response in 232 patients with various cutaneous diseases caused or complicated by pyogenic infections. Most of the diseases treated were those involving the hair follicles, and it may be presumed that staphylococci were the chief causative organisms. The solution used contained 0.1 per cent tyrothricin in a vehicle which had previously been shown to enhance the penetration of other substances into the skin. The results reported by these writers are excellent, and the preparation used was found to be nonirritating and nonsensitizing.

to some other method of local nonirritating antiseptic therapy.

7. If there is an underlying dermatophytic infection, the use of a preparation containing undecylenic acid is recommended. Irritating fungicides are harmful.

Suggested Treatment for Chronic Infections, Including Those of the Eczematous Type.—1. Penicillin should not be used locally, except possibly in noneczematous chronic follicular infections and ulcers. Parenteral injection is much the preferable method of administration.

2. Sulfonamides should never be applied locally.

3. Bacterial culture, together with determination of the sensitivity to penicillin of the bacteria recovered, is extremely useful.

4. The patient should be studied completely, and a careful history should be taken to determine the factors in regard to contactants, ingestants, trauma and general medical consideration involved.

5. Initial local treatment with bland preparations as for a dermatitis is almost always best.

6. In some instances, the administration of sulfonamides, with small initial doses, is effective.

7. Such preparations as Castellani's carbol fuchsin paint, 2 per cent silver nitrate or, if there is an underlying seborrheic dermatitis, a sulfur-salicylic acid-tar preparation are variously useful.

8. Roentgen ray therapy is sometimes helpful, but one is impressed with its gross misuse in the treatment of many dermatologic patients. It should be infrequently necessary and carefully administered, and it should not be used as a substitute for careful study of the several possible etiologic backgrounds.

SUMMARY

1. Bacteria are responsible, in greater or less degree, for a considerable proportion of the disease affecting the human skin. The disability produced by bacteria is greater than the disability produced by fungous infections. Hemolytic Staphylococcus aureus and beta hemolytic streptococci, alone or in combination, are the chief offenders.

2. The changes which are produced by bacteria in the skin may be acute and fulminating or extremely chronic. Bacteria, acting through their toxic or allergenic effects, are responsible for chronicity in many cutaneous lesions which do not appear primarily infectious.

3. The normal human skin harbors an enormous number of bacteria which are ordinarily harmless. These may be divided roughly into a resident and a transient population (Price). The resident population usually remains fairly stable, both quantitatively and qualitatively, in any person. However, some influences, particularly heat and moisture, cause considerable changes in the number of bacteria on the normal skin. Pathogenic bacteria may sometimes suddenly become members of the resident flora of the skin and may then be extremely persistent and difficult to dislodge.

4. Several factors apparently play a role in the remarkable protection which the normal human skin affords against bacterial invasion. However, these factors are by no means well understood, and further basic study of them will increase the effectiveness of methods of aiding the skin to resist damage from bacteria.

5. When the integrity of the human skin is disturbed, harmful bacteria readily become well established residents of the diseased area. In the management of cutaneous diseases which are characterized by inflammatory reaction, it is important to avoid the use of measures which may further irritate the skin and to recognize and treat bacterial invasion promptly.

6. The usefulness of topical penicillin therapy in the treatment of superficial infections of the skin is seriously jeopardized by an increased incidence of contact sensitivity which is being encountered. The present incidence of sensitivity reactions is apparently over 15 per cent, and this percentage may increase as more persons are exposed to the drug.

7. Superficial acute infections such as impetigo and ecthyma ordinarily respond promptly to local penicillin therapy. The responsible bacteria are not always removed rapidly, however, and continued care and observation for several days after apparent cure is necessary to prevent relapses.

8. The response of chronic cutaneous infections, or of chronic eczematous lesions in which there is an element of infection, to penicillin therapy is only moderately good.

9. Local application of sulfonamides to sites of superficial infection has little or no place in present day therapy. While the development of sensitivity in a significant proportion of patients can be prevented by using sulfonamide ointment only for primary acute superficial infections and for periods of not longer than five days, experience has shown that it is impossible to insure observation of these precautions in practice. Sulfonamides by mouth still retain a definite place in the management of certain acute and chronic infections of the skin and can ordinarily be given without severe reactions, provided that reasonable precautions are exercised.

10. While definite improvement in the methods of dealing with superficial bacterial infections of the skin has been achieved, these methods are susceptible of further improvement. In particular, the development of penicillin or sulfonamide compounds with a decreased capacity for sensitizing the skin and other tissues is needed. There is also need for nonsensitizing chemical antiseptics which have a greater antibacterial power in vivo than those now available.

Carcinoma of Lung.—While published statistics vary, the majority indicate that about 50 per cent of primary carcinomas involve either the upper middle or the lower lobe of the lung. Further, the cases that can be treated surgically usually are included in this group, since carcinoma of a main bronchus rarely is operable unless discovered in its incipience. Since from 30 to 40 per cent of cases occur beyond the range of vision of the bronchologist, these offer a direct challenge diagnostically, for they are the cases that more often must be diagnosed either by exploratory thoracotomy, aspiration biopsy or other means and frequently are not brought to a final conclusion diagnostically until other plans of diagnosis and therapy are tried and valuable time is lost.—Clerf, Louis H., and Herbut, Peter A.: Diagnosis of Bronchogenic Carcinoma by Examination of Bronchial Secretions, *Ann. Otol., Rhin. & Laryng.* **55**:646 (Sept.) 1946.

Special Article

HISTORY OF THE AMERICAN MEDICAL ASSOCIATION

MORRIS FISHBEIN, M.D.
Editor, Journal of the American Medical Association and Hygeia, the Health Magazine
Chicago

(Continued from page 638)

(NOTE.—Following are the second and third chapters of a history of the American Medical Association, in process of development for publication in connection with the celebration of the Centennial of the American Medical Association in Atlantic City in June 1947.

The general account of the history of the Association will be followed by individual histories of the various councils, bureaus, publications and other activities of the Association. The general account is written by the editor of THE JOURNAL. *Each of the other historical contributions will be by a member of the individual council, bureau or agency responsible and now associated with it or directly related to its work. Included will be photographs, signatures and a brief biography of each of the hundred presidents of the American Medical Association. This feature has been prepared by Dr. Walter L. Bierring.*

It will be impossible to publish all of the material in THE JOURNAL. *The complete work will be published in book form. It is hoped to have it available by the time of the annual session.*—ED.)

CHAPTER 2. *The Organization of the American Medical Association*

On May 5, 1847 the delegates to the National Medical Convention met in the hall of the Academy of Natural Sciences in Philadelphia. Dr. Isaac Hays, chairman of the Committee on Arrangements from the Philadelphia delegation, welcomed the delegates to the city. He told them of the gratification afforded the Philadelphia physicians in receiving the members of the convention as their guests. He then proposed the name of Dr. Jonathan Knight of Connecticut as chairman. A credentials committee was established and also a nominating committee, which was instructed to nominate four vice presidents and three secretaries. Permanent officers of the convention included as president Dr. Jonathan Knight of Connecticut; vice presidents, Dr. Alexander H. Stevens of New York, Dr. George B. Wood of Pennsylvania, Dr. A. H. Buchanan of Tennessee and Dr. John Harrison of Louisiana. The three secretaries were Dr. Richard D. Arnold of Georgia, Dr. Alfred Stillé of Pennsylvania and Dr. F. Campbell Stewart of New York.

A number of resolutions were introduced asking for places in the convention for any members of the previous convention who had not been elected to the present one, "any medical gentlemen present from states not represented" and any ex-officers of medicine from various medical schools or any professors from abroad who happened to be in Philadelphia. All these resolutions were most properly defeated. Similar technics for "stacking" conventions are examples of the notorious evils in democratic procedure.

Then Dr. Hays called for the reading of the report of the committee appointed in 1846. This report was read and ordered to be printed, as were also the reports on registration of births, marriages and deaths.

At the evening session of the same day a report was read on the requirements of the degree of M.D., another report on preliminary education and a portion of the report of the committee to prepare a code of medical ethics. Still later came the report from the committee on nomenclature of diseases and then the adjournment.

On the following day, after the convention assembled, Dr. N. S. Davis offered a resolution for committees to record the indigenous medical botany of our country.

A controversy developed on the resolution which dealt with the union of teaching and licensing. Here majority and minority reports were presented. Then came reading of the resolutions previously introduced, with the adoption of the resolution on preliminary education. Invitations were presented to the convention for its 1848 meeting.

Just before adjournment of the morning session, the members having perhaps become somewhat prolix, Dr. Joel Hopkins of Maryland offered a resolution to the effect that "no gentleman shall be permitted to speak more than twice on the same proposition nor occupy more than fifteen minutes for speaking, without leave of the convention." This resolution was amended by changing fifteen minutes to ten minutes and then adopted.

PRELIMINARY EDUCATION

Worthy of special note was the resolution on preliminary education of the young man in the field of medicine. The resolution read as follows:

Resolved, That this Convention earnestly recommends to the members of the medical profession throughout the United States, to satisfy themselves, either by personal inquiry or written certificate of competent persons, before receiving young men into their offices as students, that they are of good moral character and that they have acquired a good English education, a knowledge of natural philosophy and the elementary mathematical sciences, including geometry and algebra, and such an acquaintance, at least, with the Latin and Greek languages as will enable them to appreciate the technical languag: of medicine, and read and write prescriptions.

Resolved, That this Convention also recommends to the members of the medical profession of the United States, when they have satisfied themselves that a young man possesses the qualifications specified in the preceding resolution, to give him a written certificate stating that fact, and recording also the date of his admission as a medical student, to be carried with him as a warrant for his reception into the medical college in which he may intend to pursue his studies.

Resolved, That all the medical colleges in the United States be, and they are hereby recommended and requested to require such a certificate of every student of medicine applying for matriculation; and, when publishing their annual lists of graduates, to accompany the name of the graduate with the name and residence of his preceptor, the name of the latter being clearly and distinctly presented as certifying to the qualification of preliminary education.

Some of the members in the convention opposed this resolution, urging that it would prevent many young men of limited means from entering the medical profession whose natural endowments would carry them to the highest rank, notwithstanding their inadequate preliminary preparation. The argument was answered by the statement that "Our country provides school houses and almost unlimited facilities for acquiring a knowledge of at least the ordinary branches of learning." N. S. Davis said that "young men who had not mental energy and perseverence enough to comply with the standard proposed in the resolutions, certainly had not enough to enable them to do justice to a profession as extensive, intricate and arduous as ours."

These resolutions were adopted by nearly a unanimous vote and were then reaffirmed by almost every meeting of the Association that followed. They have, in fact, constituted a guiding principle in the field of medical education in this country for a hundred years. Subsequent resolutions urged lengthening of the curriculum from four months to six months, a minimum of three entire years to be devoted to the study of medicine, a minimum age of 21 for entering the practice of medicine, at least three months devoted to dissections, at least one session of hospital practice (which, to us, would mean an internship), and a method of making certain that students actually attended lectures.

CHAPTER 3. *A Permanent National Association*

Most important was the activity of the convention which resulted in the organization of a permanent national association. The committee reported in full a constitution designed to effect such a national organization. First came resolutions from the inspired physicians who thought that they had evolved better names than the one which was ultimately chosen. Thus one name considered was "The Conventional Association of the United States," another "The Medical Association of the United States of North America." Both these proposals were lost, after which the constitution developed by the committee was offered to the convention and accepted. It included the clause "This institution shall be known and distinguished by the name and title of 'The American Medical Association.'"

This constitution wisely proposed the principle of representation by making the acting members of the Association consist of delegates from medical societies and institutions in accordance with a fixed numerical ratio.

The preamble attached to the constitution declared the purpose of the organization to be "for cultivating and advancing medical knowledge; for elevating the standard of medical education; for promoting the usefulness, honor and interests of the medical profession; for enlightening and directing public opinion in regard to the duties, responsibilities and requirements of medical men; for exciting and encouraging emulation and concert of action in the profession, and for facilitating and fostering friendly intercourse between those engaged in it."

The founding fathers urged the formation of state and local associations and so framed the constitution as to make the great majority of the members of the national association consist of delegates from permanently organized state and county medical societies throughout the nation. Thus from the very first the democratic principle prevailed.

Mindful, moreover, of the scientific aspects of the organization, committees were established on medical sciences, practical medicine, surgery, obstetrics, medical education, medical literature and publication.

The convention then resolved itself into the American Medical Association.

A committee consisting of one from each state represented was appointed to nominate officers for the ensuing year, and these were unanimously elected. The officers were:

President—Dr. Nathaniel Chapman, Pennsylvania.

Vice Presidents—Drs. Jonathan Knight, Connecticut; Alexander H. Stevens, New York; James Moultrie, South Carolina; A. H. Buchanan, Tennessee.

Secretaries—Drs. Alfred Stillé, Philadelphia; J. R. W. Dunbar, Baltimore.

Treasurer—Dr. Isaac Hays, Philadelphia.

Significant of this birth-giving meeting of May 7, 1847 were resolutions leading toward the preparation and ultimate adoption of the principles of ethics.

A resolution was offered requesting the Congress of the United States to allocate a portion of the funds of the Smithsonian Institution to uses of the American Medical Association, and that resolution was laid on the table. Dr. Austin Flint of New York presented a resolution urging the states to pass laws sanctioning and providing for the prosecution of dissections. That resolution was promptly and unanimously passed.

When Dr. Nathaniel Chapman was called to the chair, he spoke briefly but expressively:

"He could find no language to express the depth of his gratitude. It had often been his good fortune during his professional life to have been complimented in the same manner, though not in the same degree. This was the most precious of all the honors he had received, as spontaneously conferred by his own brethren. He confessed his incompetence to serve the Association as he could desire. He loved his profession and should be ungrateful if he did not: whatever he possessed in this life had been bestowed by its favors; when he forgot it, or deserted it and its disciples, he remarked, with great emphasis, "may Almighty God forget and desert me." He desired that the Association should be persuaded of his ardent wishes for the cause, and that his most strenuous efforts would be unceasingly directed to advance the dignity of the profession and extend its usefulness.

QUACKERY

From the very first the American Medical Association has prosecuted its war on quackery and more than any other agency in our country can take the credit for the vast improvement that has occurred in the abolition of nostrums, secret medicines and quackery. At the session on May 7, 1847 Dr. John B. Johnson of Missouri introduced a resolution in which he pointed out that numerous and important evils result from the universal practice of allowing persons almost wholly ignorant to engage in apothecaries and still greater from the universal traffic in secret medicines. He urged that schools of pharmacy be established in the individual states and that some rule be adopted that no physician patronize a druggist or an apothecary who deals in "patent" or secret medicines.

The convention adjourned to meet in Baltimore on the first Tuesday in May 1848. Thus ended one of the most significant assemblages in the history of our nation. This was the birth of a great organization.

Dr. Nathan Smith Davis took great pride in the fact that the principle embodied in the first constitution made the national association emanate directly from local medical organizations and institutions. This system of representation gave the organization a legitimate claim to be truly representative of the whole medical profession. Indeed the representatives were so earnest in their desire to avoid dominance by any section in the work of the organization that they also incorporated in the constitution a provision which prohibited the holding of annual meetings twice in succession in the same place.

To recapitulate, the original plan of organization as adopted in 1847 provided that "members of the American Medical Association . . . should hold their appointment to membership either as delegates from local institutions, as members by invitation or as permanent members." There were thus created three classes

of membership, of which the delegates constituted the bulk and the most important part. They received their appointment from "permanently organized societies, medical colleges, hospitals, lunatic asylums and other permanently organized medical institutions of good standing." Each appointment was for one year. The basis of representation was one delegate for every ten regular resident members of the medical society, two for every regularly constituted and chartered school of medicine, two for every hospital containing 100 inmates or more, and one for all permanently organized medical institutions of good standing not included in the foregoing summary. In order to admit of representation from portions of the United States not otherwise represented, provision was made for members by invitation. If a physician from sections of the country in which no medical institutions of any sort existed attended an annual session, the Association could constitute him a member by invitation for that session only. He thus became an unofficial delegate for a section that would otherwise be without representation. Thus two classes of members, both, as will be seen, of a purely temporary character and deriving their right of membership either from the organization which they represented or from the Association which invited them to a seat in its deliberations, constituted the voting membership of the American Medical Association. In order that delegates having once been members of the Association might retain some connection with it after their time as delegates had expired, it was provided that all those who had served in that capacity and such other members as might be appointed by the Association, by unanimous vote, might be made "permanent members." They were entitled to attend the meetings and to participate in the affairs of the Association without the right to vote. It was therefore recognized from the time of the first preliminary convention in 1846 that the right to vote should be limited to the duly elected and qualified delegates of local medical societies, colleges and hospitals who came bearing credentials of their election as such. Thus the American Medical Association was from the beginning a delegate body.

When its total membership reached as many as 60,000 members in the state societies, the assignment of one delegate for every ten members would have made a representative body of 6,000. This brought about ultimately the reorganization, of which more will be told later, and led finally to the formation of the House of Delegates of the American Medical Association as we know it today.

When William H. Welch was President of the Association in 1910 he called to mind the battle which took place in the originally constituted convention over the decision as to whether there should be a representative body or an organization in which the officers would themselves perpetuate the control within a small group. "It is curious to think," said Dr. Welch, "what would have been the history of the Association had the choice not been made in favor of the more democratic representative plan."

This plan, which continued in operation for fifty-five years, was perhaps cumbersome and ineffective, but it was well suited to the conditions that existed at the time of its adoption.

Looking back at the first fifty years of life of the American Medical Association, William H. Welch noted that the founders brought into being a national organization truly representative. "Such an organization," he said, "has inherent elements of strength which secure its future even against its own blunders and still more against attacks from without. The Association has been from the beginning the great unifying force for the profession of this country, whose common interests it has been its chief endeavor to serve."

In concluding his address, William H. Welch said:

> Organized effort is a distinguishing mark of modern civilization. It is as essential for the advancement of science, of education, of social and industrial reform, of philanthropic endeavor as for the promotion of commerce. With the remarkable progress of medical science, especially during the last three decades, man's power to control disease has been vastly increased and the sphere of usefulness of the physician has been correspondingly widened and with advancing knowledge will continue to expand. The skill and knowledge of the physician and sanitarian have acquired a new and ever increasing importance and significance in the movements for social amelioration, for improvement of the conditions of labor and of living, for the conservation and most efficient utilization of the productive energy of the world, and for the reclamation of regions now yielding no return to civilization.
>
> Among the organized forces for advancing the prosperity, the happiness and the well being of the people of this country, the American Medical Association has an important part to play. We are justified in the confidence that, with the united support and loyalty of the profession, this Association, broadly representative and standing for the best ideals of medical science and art and for professional and civic righteousness, will contribute a beneficent share to the working out of our national destiny.

(To be continued)

Clinical Notes, Suggestions and New Instruments

NEW TREATMENT FOR INCOMPETENT VALVES IN VARICOSE VEINS

GERALD H. PRATT, M.D.
New York

In several reports published in the last ten years I have discussed the problem of treating varicose veins.[1] The large number of patients who are disabled from the complication of pathologic changes in the veins of the lower extremities makes this problem increasingly important.

The technic of resecting a section of the saphenous vein and its branches at the femoral junction is well standardized.[1a] The necessity of an adequate resection to divide any connection between the superficial and the femoral system high in the groin without leaving a saphenous stump requires continued emphasis. Approximately one fourth of all my new patients have had a ligation previously, and in all but 2 of these patients on whom I have reoperated in the last year either a large saphenous vein or a dilated branch acting as a saphenous vein has been found in the groin.

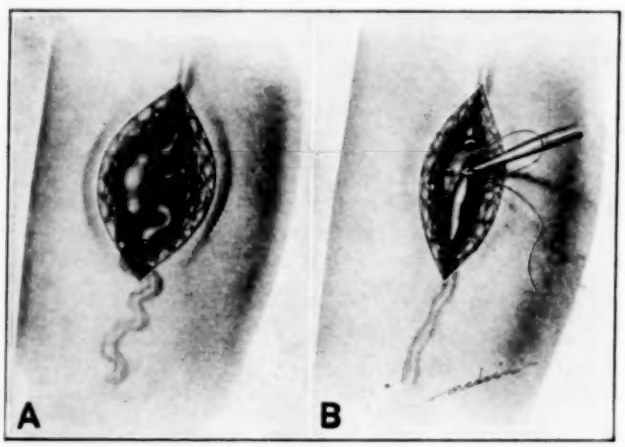
When an adequate high resection has been performed, recurrent veins, venous ulcers and other complications are the result either of failure to resect the incompetent communicating branch points at the correct juncture or of the development of new incompetent points. In 1941 a simple test for determining these incompetent points was presented.[1c] This test has proved

From the Vascular Surgical Service, New York Post-Graduate Hospital and Medical School of Columbia University.

1. (*a*) Pratt, G. H.: Surgical Treatment of Varicose Veins and Ulcers by Segmental Sclerosis, Am. J. Surg. **44:** 31-38 (April) 1939; Segmental Sclerosis of the Saphenous Vein for Varicose Veins, Ulcers and Diminished Arterial Supply, J. A. M. A. **113:** 925-927 (Sept. 2) 1939; (*b*) The Surgical Problem in Peripheral Vascular Disease, Am. J. Surg. **46:** 321-326 (Nov.) 1939; Surgical Considerations in the Treatment of Chronic Lymphedema and of Varicose Veins, Bull. New York Acad. Med. **16:** 381-388 (June) 1940; (*c*) Test for Incompetent Communicating Branches in the Surgical Treatment of Varicose Veins, J. A. M. A. **117:** 100-101 (July 12) 1941; (*d*) The Importance of a Knowledge of Vascular Surgery in World War II, Am. J. Surg. **56:** 335-336 (May) 1942. Lake, M.; Pratt, G. H., and Wright, I. S.: Arteriosclerosis and Varicose Veins: Occupational Activities and Other Factors, J. A. M. A. **119:** 696-701 (June 27) 1942. Pratt, G. H.: Results of Surgical Treatment of Varicose Veins, J. A. M. A. **122:** 797-800 (July 17) 1943.

entirely satisfactory in over 3,000 instances in both civilian and naval hospital experience and has replaced all other methods of deciding the points for resection. This test should be performed and the marking of the point should be done in the operating room just before the operation. On the average, three such incompetent points are resected.

Where incompetent valves permit femoral reflux to the superficial veins, these veins become dilated and tortuous. Because of their weight and the resultant edema, the soft tissues sag and become soft and relaxed. Noting the excellent results obtained in the treatment of varicoceles by suturing the ends of the veins together and thus suspending the resected ends, a somewhat analogous measure has been instituted after the removal of the so-called "blowout" points. After the "blowout" is resected and the feeding or T-shaped veins divided and tied off, the distal end is transfixed and sutured on tension to the deep fascia. This stretches the tortuous distal end and lifts and suspends the spongy soft tissues. The distal veins become a fibrous band which is attached to the deep tissues, and this acts as a fibrous lift to the tissues. Since in most instances the involved vein is a feeder to an ulcerous or preulcerous area at or above the inner malleolus, the tendency to ulceration is decreased. The movement of the deep fascia keeps the vein tight, empties the branches and aids its fibrosis. The physical appearance of the ankle is improved at once.



A in the illustration, resection of incompetent communicating vein with suspension of distal end. *B*, T-shaped incompetent point resected; distal end transfixed and sutured to deep fascia.

This procedure now has been followed in all instances for the last year in civilian practice and for the preceding year in the Navy, and the improvement in the condition of these legs is apparent to all observers. This is true especially when there are ulcers present. The healing time is reduced and the attendant edema and dermatitis decrease more rapidly.

No one measure can ever be the answer to the problem of varicose veins. Elimination of all incompetent valves is paramount in importance, but this does not resolve the whole problem. The fungous infection which is nearly always present needs control, and in my practice this responds best to soaks with potassium permanganate solution in 1 : 5,000 strength every second or third day. Elevation and adequate support with guided walking exercise is also helpful. Since these patients have defective valves or pathologic changes in the vein wall they will need observation from time to time. As do patients with defective teeth or with pulmonary problems, they should have a check-up examination at regular intervals. An occasional dilated vein may appear and require an injection. If incompetent connections between the femoral and the saphenous system are not present this is effective. A new incompetent point may need a local resection later.

In addition to this program, it is now suggested that the surgical suspension of the distal end of "blowout" veins will help in the control of this difficult and widespread condition. The suspension can be performed likewise in the thigh or groin when dilated tortuous veins show that it is indicated.

30 East Sixtieth Street.

Council on Pharmacy and Chemistry

REPORT TO THE COUNCIL ON PHARMACY AND CHEMISTRY

The office of the Council on Pharmacy and Chemistry and other offices at the headquarters of the American Medical Association have been receiving an increasing number of inquiries on drugs that have been used and proposed for the relief and control of asthma and allergy in general. There has been an unfortunate amount of publicity given to certain aspects of this subject, and confusion has resulted. To dispel the confusion and present the medical profession with a comprehensive review of the newer aspects of drug therapy, a report has been prepared by Dr. Samuel M. Feinberg. The Council expresses its appreciation of the cooperation shown by Dr. Feinberg. It hopes that its offices will be freely used by members of the medical and allied professions who have further inquiries concerning the availability and usefulness of the articles described in the following presentation and of other drugs that may be available but not discussed in the report by Dr. Feinberg.

AUSTIN SMITH, M.D., *Secretary.*

HISTAMINE AND ANTIHISTAMINIC AGENTS

Their Experimental and Therapeutic Status

SAMUEL M. FEINBERG, M.D.
Chicago

The demonstration of the phenomena of anaphylaxis, which had its impetus at the turn of this century, was largely responsible for the progress in the development of an understanding of the allergic diseases. First, attention was directed to the fact that the clinical symptoms of such conditions as asthma and hay fever resembled closely the anaphylactic symptoms in the guinea pig. Then, in rapid order, it was shown that the principles of active and passive sensitization, desensitization, demonstration of tests for specific sensitivity and the presence of transferable antibodies were applicable to both anaphylaxis and allergy. Particularly the phenomenon of desensitization in anaphylaxis—the production of a refractory state by frequent small injections of the antigen—was welcomed and applied to the therapy of allergic conditions.

No sooner had specific desensitization been demonstrated than experimenters began to turn their energies to find a method which would desensitize, or inhibit anaphylaxis, without the employment of a specific antigen. Such nonspecific antianaphylaxis would become an extremely useful tool not only experimentally but, conceivably, also clinically. Up to 1932, at least one hundred and sixty-five substances or methods [1] aiming at nonspecific inhibition of anaphylaxis had been reported. Among these may be mentioned barium sulfate, barium chloride, atropine, ether, chloral hydrate, nonspecific serums and proteins, desensitization with a heterologous antigen, benzene in large doses, heparin, intercurrent infection with Mycobacterium tuberculosis and reduction in barometric pressure. Although some of these methods possessed a certain degree of merit, on the whole they were impractical, too hazardous or insufficiently effective.

In recent years many additional methods aiming at nonspecific inhibition of anaphylactic shock and allergic manifestations have been proposed.[2] For the most part,

1. Hill, J. H., and Martin, L.: A Review of Experimental Studies of Non-Specific Inhibition of Anaphylactic Shock, Medicine **11**: 141 (May) 1932.
2. Feinberg, S. M.: Non-Specific Inhibition of Anaphylaxis, editorial, J. Allergy **15**: 302 (July) 1944.

these claims are negative, of doubtful value or not properly corroborated. For example: barbital, pernoston and tribromoethanol were claimed [3] to produce reduction in anaphylaxis, but the effective doses of these drugs were so toxic as to be frequently fatal. The use and abuse of potassium salts and sodium thiosulfate in the treatment of allergic manifestations led to their experimental trial by Carlson and Whitehead [4] in anaphylactic shock with negative results. According to Hofmann,[5] ascorbic acid (vitamin C) injected into guinea pigs prior to the anaphylactic dose of the antigen reduced the mortality rate to one half. Many other workers, however, failed to confirm a protective effect. The value of ascorbic acid in the therapy of allergic conditions has been disappointing.[6] The claimed benefit of hesperidin (vitamin P) in anaphylaxis [7] requires corroboration. Ethylene disulfonate (Allergosil), which has been so widely publicized in the treatment of allergy, has been found therapeutically ineffective by a committee of specialists [8] and ineffective in the inhibition of anaphylaxis.[9]

HISTAMINE—ITS ROLE IN THE MECHANISM OF ANAPHYLAXIS AND ALLERGY

From the very beginning of observations in anaphylaxis and in allergy it has been evident that even though a specific antigen is required for the production of the reaction in the individual case, the manifestations produced do not differ from those induced by different antigens. It has seemed from the start, therefore, that one substance common to all anaphylactic reactions might be responsible for the manifestations. In 1910, Dale and Laidlaw [10] pointed out the similarity of manifestations in the effect of histamine and in anaphylactic shock. This constituted the starting point for the progression of experimental evidence incriminating histamine as the mediator of anaphylactic symptoms. Best and his associates,[11] in 1927, demonstrated the presence of histamine as a normal constituent of many tissues and thus furnished a reasonable explanation for the source of the histamine in anaphylaxis. At about this time it was also becoming evident that the variation in the anaphylactic manifestations in different species of animals could be reasonably explained on the basis of quantitative differences in histamine content. Later it was shown [12] that the lungs of guinea pigs and the livers of dogs were decidedly reduced in histamine content after anaphylactic shock. Subsequently a histamine-like substance was demonstrated [13] in the blood and thoracic duct lymph of the dog during anaphylaxis, and a similar substance was found [14] in the blood of the guinea pig.

When the amounts of histamine found in the anaphylactic dog in the blood of the inferior vena cava just above the diaphragm were observed to be similar to those amounts required to produce the same vascular changes by intravenous injection, Dragstedt and Mead [15] were able to complete the case for histamine as an important factor in the production of the manifestations of anaphylaxis. It was subsequently shown by Code [16] that 70 to 100 per cent of the normal blood histamine of man, horse, goat, calf, dog, bullock and guinea pig was in the white cells.

There is no valid argument against the evidence that histamine constitutes a potent factor in the production of the symptoms of anaphylactic shock. There is justification for the assertion that not all the manifestations can be explained on the basis of histamine activity. One such outstanding phenomenon is the incoagulability of the blood. This has been satisfactorily accounted for by the demonstration of a release of heparin during anaphylaxis. Other anaphylactic manifestations not attributable to histamine, and the mechanism of which is not properly explained, are the early increased blood coagulability, the leukopenia, changed sedimentation rate and the delayed death from anaphylactic shock occurring in some instances.

The evidence for the role of histamine in the mechanism of production of allergic manifestations in man has not kept pace with that for anaphylaxis in animals. A good part of the evidence in favor of the histamine concept of allergy is based on the demonstration of the various points of resemblance between allergic and anaphylactic reactions, and on the fact that the effects of histamine administered to man are consistent with some of the phenomena of allergy. It was shown by Lewis and Grant [17] and others that the whealing of dermographism, or urticaria factitia, and of specific food allergy had all the characteristics of histamine wheals. Subsequently it was demonstrated [18] that the manifestations of hypersensitiveness to cold—a drop in blood pressure and an increase in pulse rate, gastric acidity and skin temperature—were those resembling the action of histamine.

Although there is some indication that there is an increased level of histamine in the blood in allergic reactions,[19] the amounts involved and the difficulties

3. Hofmann, H.: Ueber die pharmakologische Beeinflussung des anaphylaktischen Schocks durch Narkotica und Analeptica, Arch. f. exper. Path. u. Pharmakol. **199:** 664, 1942.

4. Carlson, R. G., and Whitehead, R. W.: The Effect of Sodium, Potassium and Thiosulfate Ions on Anaphylaxis, J. Allergy **14:** 462 (Sept.) 1943.

5. Hofmann, H.: Ueber Die Beeinflussung des anaphylaktischen Schocks durch Vitamin C und Nebennierenrindehormon, Arch. f. exper. Path. u. Pharmakol. **199:** 631, 1942.

6. Friedlaender, S., and Feinberg, S. M.: Vitamin C in Hay Fever: Therapy and Blood Levels, J. Allergy **16:** 140 (May) 1945. Hebald, S.: Clinical Evaluation of Ascorbic Acid in the Treatment of Hay Fever, ibid. **15:** 236 (May) 1944.

7. Hiramatsu, N.: Studies on Vitamin P (Hesperidin): IV. Influence of Hesperidin upon Serum Anaphylaxis, Jap. J. Dermat. & Urol. **49:** 304, 1941; abstracted, Far East. Bull. **1:** 37 (Sept.) 1941.

8. Report of Committee on Medicaments and Pharmaceuticals, read at the meeting of the American Academy of Allergy, Dec. 9, 1945.

9. Fisk, R. T.; Small, W. S., and Foord, A. G.: The Experimental Use of Ethylene Disulfonate (Allergosil Brand) in the Prevention of Anaphylaxis in Guinea Pigs, J. Allergy **15:** 14 (Jan.) 1944.

10. Dale, H. H., and Laidlaw, P. P.: The Physiological Action of B-Iminazolylethylamine, J. Physiol. **41:** 318, 1910.

11. Best, C. H.; Dale, H. H.; Dudley, H. W., and Thorpe, W. V.: The Nature of the Vaso-Dilator Constituents of Certain Tissue Extracts, J. Physiol. **62:** 397 (March) 1927.

12. Watanabe, K.: Quantitative Untersuchungen über den Gehalt an Darmkontrahierenden Stoffen von Lunge und Leber bei Meershweinchen in Stadium der Eiweissensibilisierung und im anaphylaktischen Schock, Ztschr. f. Immunitätsforsch. u. exper. Therap. **72:** 50, 1931; Der Gehalt der Hundeorgane an Darmkontrahierenden und Blutdrucksenkenden Stoffen im Stadium der Eiweissensibilisierung und im anaphylaktischen Schock, ibid. **73:** 149, 1931.

13. Dragstedt, C. A., and Gebauer-Fuelnegg, E.: Studies in Anaphylaxis: I. The Appearance of a Physiologically Active Substance During Anaphylactic Shock, Am. J. Physiol. **102:** 512 (Nov.) 1932.

14. Code, C. F.: The Histamine Content of the Blood of Guinea Pigs and Dogs During Anaphylactic Shock, Am. J. Physiol. **127:** 78 (Aug.) 1939.

15. Dragstedt, C. A., and Mead, F. B.: The Role of Histamine in Canine Anaphylactic Shock, J. Pharmacol. & Exper. Therap. **57:** 419 (Aug.) 1936.

16. Code, C. F.: The Source in the Blood of the Histamine-like Constituent, J. Physiol. **90:** 349 (Aug. 17) 1937.

17. Lewis, T., and Grant, R. T.: Vascular Reactions of the Skin to Injury: Notes on the Anaphylactic Skin Reaction, Heart **13:** 219 (Sept.) 1926.

18. Bray, G. W.: A Case of Physical Allergy, J. Allergy **3:** 367 (May) 1932. Horton, B. T., and Brown, G. E.: Systemic Histamine-like Reactions in Allergy Due to Cold: Report of Six Cases, Am. J. M. Sc. **178:** 191 (Aug.) 1929.

19. Tarras-Wahlberg, B.: Blood-Histamine in Salvarsan Dermatitis, Acta dermat.-venereol. **18:** 284 (June) 1937. Capps, R. B., and Young, R. H.: Hypersensitivity to Light: Studies on an Unusual Case Treated Successfully with Histamine, J. Clin. Investigation **19:** 778 (Sept.) 1940. Randolph, T. G., and Rackemann, F. M.: The Blood Histamine Level in Asthma and in Eosinophilia, J. Allergy **12:** 450 (July) 1941.

in technic have not permitted conclusive proof of this point. Recent improvements of the methods used in isolating the blood histamine and new methods of quantitatively measuring it may give much more satisfactory data. The fact that the histamine in the leukocytes is released from the blood in vitro by the addition of the specific allergen [20] not only is a further demonstration of the role of histamine in allergic reactions, but it points toward many further possibilities of studying the mechanism of allergy. It has been shown [21] further that histamine can be released from the skin by the application of the specific agent.

HISTAMINE THERAPY AND TOLERANCE

On the basis of the presumed role of histamine in the mechanism of allergy and on the supposition that a tolerance to histamine could be obtained by repeated administration of this agent, many clinicians were influenced to undertake histamine therapy in allergic diseases. Ramirez and St. George [22] in 1924 reported their observations in a group of patients with "endogenous" asthma. They believed that this group owed their difficulties to the fact that they were more sensitive to histamine than were other persons. They treated 10 patients with increasing doses of histamine and obtained temporary good results in 2. In 1935, Dzsinich [23] claimed good therapeutic results with small doses of histamine in a series of patients with asthma and urticaria. It has also been claimed by Farmer [24] that effective results may be obtained in asthma and vasomotor rhinitis by frequently repeated small doses of histamine.

A series of injections of histamine was claimed by Millet [25] to produce favorable results in angioneurotic edema. Ernestene and Banks [26] treated a group of 13 patients with pruritus, urticaria and angioneurotic edema, using 0.5 mg. doses of histamine, at first twice a day, then less frequently. They reported improvement in half the cases, although recurrences were present. In spite of the claimed results the authors stated that "no evidence of diminished sensitivity to histamine was observed in our patients."

In 1927, Friedlaender and Petow [27] described good results in a series of cases of migraine with the administration of small doses of histamine (0.01 to 0.001 mg.) every two days. Horton and his associates [28] in 1939 described the syndrome of "erythromelalgia of the head" in 84 patients. This consisted of periodic attacks of simple migraine, with the following manifestations on the affected side: swelling of the temporal vessels, flushing and increased temperature of the skin, engorgement of the soft tissues of the eye and watering of the eye and nose. These authors regarded this type of headache as due to the release of histamine. They claimed to reproduce the syndrome in these persons by the injection of 0.3 to 0.5 mg. of histamine. The patients were treated by subcutaneous injections of the substance. The reports resulted in a fairly extensive trial of histamine in various types of headache. One of the most recent reports is that of Butler and Thomas,[29] who claimed that excellent results were obtained in a series of patients with migraine by the intravenous administration of histamine.

Attempts to demonstrate that histamine tolerance can be achieved have been inconclusive. Farmer [30] attempted to prove that the oral and parenteral administration of histamine influenced the sensitivity of the uterine strip of the guinea pig to histamine and to the specific antigen. From the standpoint of the usual range of variations in the results of such experiments, his data cannot be regarded as impressive. Karady [31] has also presented evidence favoring histamine tolerance. She found that pretreatment with histamine in guinea pigs caused increased tolerance to the activity of histamine amounting to 100 per cent. Anaphylactic death in guinea pigs sensitized to horse serum could be prevented in the majority by pretreatment with histamine, while in sensitivity to the whites of eggs pretreatment with histamine had no influence on anaphylactic shock. Such varying results make the entire report of doubtful value. Clark and MacKay [32] gave daily injections of histamine for two weeks to a series of guinea pigs: they were not able to show the development of a tolerance to histamine. Mayer, in the course of experimenting with anatagonists to histamine, observed that repeated inhalations of histamine did not cause increased tolerance. Wells, Gray and Dragstedt,[33] working with dogs, found in a large series of trials that there was no evidence of tolerance or desensitization induced as a result of repeated injections of histamine.

Attention should be called to the fact that there is a wide range of sensitivity to histamine in different persons and that there is a lack of real evidence that the variations are greater among allergic than among nonallergic persons. There is not a sound basis for the belief that allergic manifestations are produced because of a heightened sensitivity to histamine. If histamine has to do with the allergic reaction it is because an amount above the tolerance dose is released from the tissues. Repeated observations over many years lead me to believe that injections of histamine in man do not increase his tolerance, that each individual has his own particular reactive dose, and that this dose is not affected by treatment with histamine. Furthermore, even if it were granted that in animals or man the tolerance to histamine could be increased twofold or threefold by such treatment, such protection could not suffice for the conditions encountered in anaphylaxis and allergic reactions. From my experience and from that of others it is felt that the effectiveness of histamine in allergic conditions has been exaggerated, and that whatever beneficial results are obtained must be explained on a basis other than desensitization to histamine.

20. Katz, G., and Cohen, S.: Experimental Evidence for Histamine Release in Allergy, J. A. M. A. **117**: 1782 (Nov. 22) 1941.
21. Katz, G.: Histamine Release in the Allergic Skin Reaction, Proc. Soc. Exper. Biol. & Med. **49**: 272 (Feb.) 1942.
22. Ramirez, M. A., and St. George, A. V.: A Contribution to the Etiology of Asthma, M. J. & Rec. **119**: 71 (Jan. 16) 1924.
23. Dzsinich, A.: Die Histaminbehandlung allergischer Zustände (Asthma bronchiale, Urticaria), Klin. Wchnschr. **14**: 1612 (Nov. 9) 1935.
24. Farmer, L.: The Histamine Treatment of Allergic Diseases, J. Lab. & Clin. Med. **26**: 802 (Feb.) 1941.
25. Millet, R. F.: Heat Sensitiveness, Angioneurotic Edema, Purpura and Ulcers of the Leg Following Femoral Thrombophlebitis, M. Clin. North America **15**: 237 (July) 1931.
26. Ernestene, A. C., and Banks, B. M.: Use of Histamine in the Treatment of Pruritus: Preliminary Report, J. A. M. A. **100**: 328 (Feb. 4) 1933.
27. Friedlaender, W., and Petow: Migräne als Symptom von Cholango-Hepatopathien und ihre Behandlung mit Histamin, Med. Klin. **23**: 1498 (Sept. 30) 1927.
28. Horton, B. T.; MacLean, A. R., and Craig, W. McK.: A New Syndrome of Vascular Headache: Results of Treatment with Histamine: Preliminary Report, Proc. Staff Meet., Mayo Clin. **14**: 257 (April 26) 1939.
29. Butler, S., and Thomas, W. A.: Intravenous Histamine in the Treatment of Migraine, J. A. M. A. **128**: 173 (May 19) 1945.
30. Farmer, L.: Nonspecific "Desensitization" Through Histamine, J. Immunol. **36**: 37 (Jan.) 1939; Experiments on Histamine-Refractoriness: II. Nonspecific "Desensitization" Through Oral Application of Histamine, ibid. **37**: 321 (Oct.) 1939.
31. Karady, E. S.: Histamine Tolerance and Anaphylactic Death in Sensitized Guinea Pigs, J. Immunol. **41**: 1 (May) 1941.
32. Clark, W. G., and MacKay, E. M.: Effect of Histamine Pretreatment upon Some Physiological Changes Following Adrenalectomy, Am. J. Physiol. **126**: 465 (July) 1939.
33. Wells, J. A.; Gray, J. S., and Dragstedt, C. A.: An Investigation of the Question of Histamine Tolerance, J. Allergy **13**: 77 (Nov.) 1941.

HISTAMINE-AZOPROTEIN

Since unbound histamine failed to produce antibodies to itself after its parenteral administration, it was thought by Fell and his associates [34] that a histamine conjugate might be more effective in the stimulation of antibodies to histamine. By means of azo linkage, they coupled histamine to various proteins such as casein, horse serum globulin, cow serum globulin and dog serum. In precipitin tests on rabbits' blood they found that the specificity had been partly determined by the hapten portion (histamine). However, the precipitin titer for the protein fraction was fully as high. In a series of guinea pigs sensitized to ovalbumin and showing a mortality rate of 52 per cent from anaphylactic shock, pretreatment with histamine-azo-despeciated horse serum globulin diminished the mortality rate to 8 per cent. Other types of immunologic experiments also indicated that animals treated with histamine conjugate antigens developed antibodies that were partially specific for the histamine hapten.

Sheldon and his associates [35] in 1941 reported their results of treatment with histamine-azoprotein in a series of 39 patients. The duration of treatment varied from 1 to 20 months, and the highest dosage of the solution ranged from 0.1 to 1.0 cc. of a 1 : 10 antigen. Of 17 patients with atopic or contact dermatitis, 8 had either excellent or good results. Of 22 patients with asthma, rhinitis, urticaria and other allergic manifestations, excellent results were obtained in 10. Cohen [36] claimed to have obtained good clinical results, but presented no statistical data in substantiation.

In sampling the clinical experience of allergists, the Committee on Pharmaceuticals and Medicaments of the American Academy of Allergy obtained information which indicates that those who have given the histamine-azoprotein a fair trial either have found it totally ineffective or have been able to attribute whatever measure of effectiveness it had to its nonspecific action. My own personal experience has been in agreement with that of the majority of other allergists. Although I began to use this substance over five years ago, I have seen only occasional benefit in allergic conditions.

In 1943, Cohen and Friedman [37] presented data in support of the claim that histamine-azoprotein injections in man developed precipitins and antibodies capable of neutralizing histamine. Insufficient controls and irregularity of the results make the value of these observations open to doubt. Cohen and Friedman [38] also showed that allergic patients treated with histamine-azoprotein displayed a heightened tolerance to histamine by iontophoresis as compared with a normal group of subjects. However, figures were not presented for the histamine tolerance of these allergic patients prior to treatment with the histamine conjugate. In a recent report Cohen and Friedman [39] stated that the degree of immunity afforded by this treatment is not great, but they believed that it serves as an adjunct in well managed cases of allergy. Hebald and his associates [40] failed to obtain a protective action against constitutional reactions from moderate ragweed overdosage by pretreatment with histamine-azoprotein. Dundy and his collaborators [41] could not obtain any change in wheeling responses or in the clinical conditions of allergic patients.

A recent paper by Coffin and Kabat [42] may throw light on the general confusion of the status of this compound. They conducted experiments to determine the effect of treatment with histamine-azoprotein on histamine tolerance and on anaphylaxis in the guinea pig. Pretreatment with histamine-azoprotein did not have a significant influence on the mortality rate from the minimum lethal dose of histamine given intravenously. Passively sensitized animals pretreated with histamine-azoprotein, either alum-precipitated or with adjuvants, displayed a definite protection against anaphylaxis. However, animals pretreated with human serum and adjuvants showed similarly striking anti-anaphylactic capacities.

It would seem that this whole subject of protection against anaphylaxis and histamine needs a more careful reevaluation.

HISTAMINASE

In 1929 Best [43] demonstrated that some of the tissues contain a substance or enzyme capable of destroying histamine. The ability of this histaminase to destroy histamine when the two are mixed and incubated was confirmed by many workers. It was only natural that much hope should have been raised in the expectation that an antihistaminic and an antiallergic substance had been found which would be effective in allergic conditions. Many experimenters soon discovered that although histaminase does destroy histamine under ideal conditions in vitro, it lacked an effect on histamine or anaphylaxis in the living animal.

A case of hypersensitiveness to cold was claimed by Roth and Horton [44] in 1937 to have responded to therapy with histaminase. In 1939, Foshay and Hagebusch [45] claimed effective results from the use of this medicament in serum sickness. This was followed by widespread use of histaminase and by a number of favorable clinical observations, such as those in vasomotor rhinitis,[46] hay fever,[47] insulin allergy,[48] urticaria,[49] dermatoses [50] and almost all allergic manifestations.[51]

34. Fell, N.; Rodney, G., and Marshall, D. E.: Histamine-Protein Complexes: Synthesis and Immunologic Investigation; I. Histamine Azo-Protein, J. Immunol. **47**: 237 (Sept.) 1943.
35. Sheldon, J. M.; Fell, N.; Johnston, J. H., and Howes, H.: A Clinical Study of Histamine Azoprotein in Allergic Disease (Preliminary Report), J. Allergy **13**: 18 (Nov.) 1941.
36. Cohen, M. B.: The Immunologic Management of a Patient with Allergy, J. Allergy **15**: 274 (July) 1944.
37. Cohen, M. B., and Friedman, H. J.: Antibodies to Histamine Induced in Human Beings by Histamine Conjugates, J. Allergy **14**: 195 (March) 1943.
38. Cohen, M. B., and Friedman, H. J.: Immunity Against H-Substance, J. Allergy **15**: 245 (July) 1944.
39. Cohen, M. B., and Friedman, H. J.: Histamine Azo-Protein in Treatment of Allergy, paper read before the Second Annual Meeting of the American Academy of Allergy, Dec. 10, 1945.
40. Hebald, S.; Cooke, R. A., and Downing, L.: Clinical and Serological Study of Histamine Azo-Protein in Cases of Ragweed Hay Fever, paper read before the Second Annual Meeting of the American Academy of Allergy, Dec. 10, 1945.
41. Dundy, H. D.; Zohn, B., and Chobot, R.: Clinical Evaluation of Histamine Azo-Protein, paper read before the Second Annual Meeting of the American Academy of Allergy, Dec. 10, 1945.
42. Coffin, G. S., and Kabat, E. A.: The Effects of Immunization with Histamine Azoprotein on Histamine-Intoxication and Passive Anaphylaxis in the Guinea Pig, J. Immunol. **52**: 201 (March) 1946.
43. Best, C. H.: Disappearance of Histamine from Autolyzing Lung Tissue, J. Physiol. **67**: 256 (June) 1929.
44. Roth, G. M., and Horton, B. T.: Hypersensitiveness to Cold: Treatment with Histamine and Histaminase; Report of a Case, Proc. Staff Meet., Mayo Clin. **12**: 129 (March 3) 1937.
45. Foshay, L., and Hagebusch, O. E.: Histaminase in the Treatment of Serum Sickness, J. A. M. A. **112**: 2398 (June 10) 1939.
46. Roth, G. M., and Horton, B. T.: Histaminase: Physiologic Effects on Man and Its Therapeutic Value in Medicine, Bull. New York Acad. Med. **16**: 570 (Sept.) 1940.
47. Frank, D. E.: Histaminase Intramuscularly in Hay Fever, New York State J. Med. **43**: 339 (Feb. 15) 1943.
48. Roth, G. M., and Rynearson, E. H.: The Use of Histamine and Histaminase in the Treatment of Allergic Reaction to Insulin, Proc. Staff Meet., Mayo Clin. **14**: 353 (June 7) 1939.
49. (*a*) Laymon, C. W., and Cumming, H.: Histaminase in the Treatment of Urticaria and Atopic Dermatitis: Preliminary Report, J. Invest. Dermat. **2**: 301 (Dec.) 1939. (*b*) Knoll, A. F., and Beinhauer, L. G.: Experimental and Clinical Observations with Histaminase, Arch. Dermat. & Syph. **42**: 896 (Nov.) 1940.
50. Goldberg, L. C.: Histaminase in the Treatment of Allergic Dermatoses, J. A. M. A. **115**: 429 (Aug. 10) 1940.
51. Prickman, L. E.: The Use of Histaminase in Certain Allergic Conditions, J. Allergy **12**: 193 (Jan.) 1941.

Concomitantly with the above claims there began to appear reports from clinicians having extensive experience with allergic manifestations and their evaluation. Toomey and Kriete [52] found that histaminase caused neither prevention nor amelioration of serum sickness. Eger and Stone,[53] administering the drug orally throughout the course of serum sickness in a series of patients, failed to observe a difference in the severity or duration of their symptoms as compared with those of an untreated group. In a series of hay fever patients Keeney [54] observed no benefit. Miller and Piness [55] failed to obtain results in any cases of hay fever, asthma or atopic dermatitis. Benefit was not obtained in a series of 48 children with various types of allergy by Peshkin and his associates.[56] Frank and Harris [57] found histaminase ineffective against asthma, vasomotor rhinitis and urticaria. In 1940 Alexander [58] concluded that the results of histaminase therapy were disappointing, although he felt that further investigation was warranted. My own clinical experiences with histaminase dating back nearly ten years indicate that it lacks a specific effect in allergic conditions. Best, the discoverer of histaminase, was finally moved in 1940, together with McHenry,[59] to make the following statement: "Our investigations over a period of 10 years have failed to show that the intravenous or intramuscular administration of histaminase has any effect upon histamine present in the body or on that given by injection. . . . For some years we have consistently answered numerous inquiries about histaminase with the statement that we believed there was no physiological basis on which to rest its clinical use."

The Council on Pharmacy and Chemistry of the American Medical Association [60] in 1940 issued a report stating that histaminase and the brand Torantil did not show sufficient evidence of clinical worth to justify its inclusion in N. N. R.

There is considerable evidence that histaminase does not modify the whealing reactions in man. In a cold-sensitive patient Maisel and Abramson [61] made careful studies of the measurements of whealing produced by a standard cold stimulus: prolonged treatment with histaminase did not produce changes in the size of the wheal or in its rate of formation. Keeney [54] failed to obtain change in the histamine wheals in hay fever subjects who were treated with histaminase. Miller and his associates [62] demonstrated that the oral or parenteral use of histaminase did not have influence on the reactions of the skin to dilutions of histamine or on the sensitivity of passively sensitized sites to an allergen. Change in the size of histamine wheals was not observed by Knoll and Beinhauer [49b] in 50 nonallergic subjects after prolonged administration of histaminase. Vaughan and Blanton [63] also failed to obtain changes in histamine whealing. Simon [64] showed, further, that the injection of histaminase locally did not influence either the histamine wheal or the wheal produced by a specific allergen in a passively sensitized site. In a study of 36 allergic patients, Rose [65] found that the administration of histaminase did not alter the blood histamine levels.

The claim of Karady and Browne [66] in 1939 that histaminase was effective in the prevention of histamine and anaphylactic shock led many other workers to reinvestigate this subject. Alexander and Bottom,[67] Youngener and his associates [68] and Rose and Browne [69] failed to prevent histamine shock in guinea pigs by the administration of histaminase. That histaminase is ineffective in the prevention of anaphylactic shock was demonstrated by the reports of Courtright and his associates,[70] Hawes and his co-workers [71] and Barlow and Homburger.[72] The experimental asthma produced in guinea pigs by the inhalation of an atomized antigen was not influenced by histaminase, according to Neeley.[73]

SYMPATHOMIMETIC DRUGS

It is not the purpose of this paper to discuss the entire range of drugs employed in the therapy of allergic manifestations. The only object in mentioning the sympathomimetic drugs at this juncture is to point out the difference in the mechanism of their action as compared with that of the antihistaminic agents. Epinephrine, ephedrine, Propadrine hydrochloride and similar drugs owe their antiallergic action primarily to the vasoconstriction they produce. They apparently have no appreciable action on the immunologic or chemical mechanism involved in the allergic reaction. It is important to realize this for several reasons, including the limitations of their action and the fact that they do not interfere with the concomitant use of antihistaminic agents.

EARLY ANTIHISTAMINIC AGENTS

The realization that histamine plays an important part in the anaphylactic and allergic reaction has led to considerable effort to discover a means of combating this substance. Almost all the proposed methods which showed any appreciable degree of promise have had in

52. Toomey, J., and Kriete, F.: Torantil (Histaminase) in Urticaria Following Serum Administration, J. Pediat. **24:** 290 (March) 1944.

53. Eger, S. A., and Stone, J. E.: The Use of Histaminase in Prophylactic Tetanus Antitoxin Reactions, Pennsylvania M. J. **47:** 371 (Jan.) 1944.

54. Keeney, E. L.: Histaminase in the Treatment of Hay Fever, J. A. M. A. **114:** 2448 (June 22) 1940.

55. Miller, H., and Piness, G.: Histaminase in the Treatment of Allergy, J. A. M. A. **114:** 1742 (May 4) 1940.

56. Peshkin, M. M.; Rapaport, H. G.; Messer, W.; Feuer, I.; Sicular, A., and Berger, A.: Histaminase in the Treatment of Allergy in Children, J. Pediat. **22:** 428 (April) 1943.

57. Frank, D. E., and Harris, M. C.: Histaminase: Experimental and Clinical Studies, M. Clin. North America **25:** 849 (May) 1941.

58. Alexander, H. L.: Treatment of Allergic Disorders with Histamine and Histaminase, J. Lab. & Clin. Med. **26:** 110 (Oct.) 1940.

59. Best, C. H., and McHenry, E. W.: A Note on Histaminase, Canad. M. A. J. **43:** 163 (Aug.) 1940.

60. Preliminary Report on Histaminase (Torantil), report of the Council on Pharmacy and Chemistry, J. A. M. A. **115:** 1019 (Sept. 21) 1940.

61. Maisel, F. E., and Abramson, H. A.: Quantitative Measurement of Whealing in Hypersensitiveness to Cold Treated with Histamine and Histaminase, J. Allergy **12:** 6 (Nov.) 1940.

62. Miller, H.; Hawes, R. C., and Piness, G.: Histaminase in Allergy: A Study of Its Effects on Skin Reactivity to Histamine and to Allergens, J. Allergy **12:** 335 (May) 1941.

63. Vaughan, E. W., and Blanton, W. B.: Studies in Histaminase: Effect of Histaminase on Histamine Wheal, North Carolina M. J. **2:** 116 (March) 1941.

64. Simon, F. A.: Experiments with Histaminase, J. Invest. Dermat. **3:** 299 (Aug.) 1940.

65. Rose, B.: Studies on Blood Histamine in Cases of Allergy: III. The Effect of the Administration of Histaminase on the Symptoms and Histamine Content of the Blood in Patients with Allergy, J. Allergy **12:** 441 (July) 1941.

66. Karady, S., and Brown, J. S. L.: Effect of Histaminase Treatment on Histamine and Anaphylactic Shock in Guinea-Pigs, J. Immunol. **37:** 463 (Nov.) 1939.

67. Alexander, H. L., and Bottom, D.: Failure of Histaminase to Protect Guinea Pigs Against Histamine and Anaphylactic Shock, J. Immunol. **39:** 457 (Dec.) 1940.

68. Youngener, J. S.; Freedman, S. I., and Nungester, W. J.: Failure of Histaminase to Prevent Histamine Shock in Guinea Pigs, Proc. Soc. Exper. Biol. & Med. **46:** 187 (Jan.) 1941.

69. Rose, B., and Browne, J. S. L.: Effect of Histaminase Pretreatment on Histamine Shock in Guinea Pigs, J. Immunol. **41:** 409 (Aug.) 1941.

70. Courtright, L. J.; Hurwitz, S. H., and Courtright, A. B.: Inhalant Sensitization and Shock in Guinea Pigs Under Controlled Atmospheric Conditions: Histamine, Histaminase, and Acetylcholine as Possible Preventives, J. Allergy **13:** 444 (July) 1942.

71. Hawes, R.; Alles, G. A., and Miller, H.: The Question of Protection Against Histamine and Anaphylactic Shock in Guinea Pigs by Histaminase, J. Lab. & Clin. Med. **27:** 337 (Dec.) 1941.

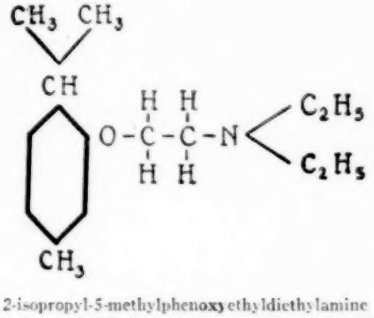
72. Barlow, O. W., and Homburger, E.: Influence of Histaminase on Course of Anaphylaxis and Histamine Shock in Guinea Pigs, J. Allergy **12:** 346 (May) 1941.

73. Neeley, F. L.: Experimental Asthma: Treatment with Histaminase, J. Lab. & Clin. Med. **27:** 319 (Dec.) 1941.

common the characteristic of competitive action, i. e., their activity is due to competitive attachment to the cell receptor, thus displacing or replacing histamine.

The amino acids, histidine, cysteine and arginine were shown to have histamine-inhibiting properties. In 1937, Edlbacher and his associates [74] showed that these substances inhibited the contraction of the guinea pig intestine produced by histamine. Arginine was then found to inhibit the contraction of the sensitized guinea pig intestine [75] and to prevent anaphylactic shock.[76] The antihistaminic action of histidine was corroborated by the work of Mackay [77] and Halpern.[78] The behavior of the amino acids was recently reinvestigated by Landau and Gay.[79] In the main, these workers corroborated the results obtained by the earlier investigators, but they pointed out that not all histamine symptoms could be prevented and that effective doses of arginine would cause a high incidence of fatal toxic reactions. They did not discover evidence of inhibition of anaphylactic shock by arginine. A 2 per cent arginine solution given intracutaneously in man failed to affect the pollen reaction either when injected into the wheal or when combined with the pollen. There has been general agreement that the amino acids are not sufficiently active agents, and that they are too toxic for animals and man.

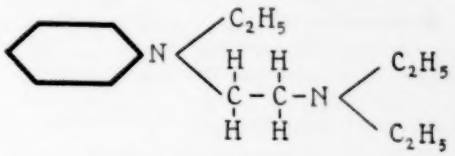
In 1933 Fourneau and Bovet [80] demonstrated that certain phenolic ethers have the property of counteracting the action of histamine in vivo and in vitro. This constituted the starting point for the development of the subject of modern antihistaminic drugs. Fourneau and Bovet found the most effective of their phenolic ethers to be:



2-isopropyl-5-methylphenoxyethyldiethylamine
(thymoxyethyldiethylamine or compound 929 F)

Bovet and Maderini [81] demonstrated that this substance has an ergotoxine-like effect on the reversal of the pressor action of epinephrine. In 1937 Staub and Bovet [82] described the antianaphylactic properties of this drug. The compound was found to protect guinea pigs against two lethal doses of histamine, but it produced well defined toxic effects in the animals.[82] Climenko and his associates [83] did not regard this drug as truly antihistaminic because they found that it was able to prevent the uterine horn contractions of barium chloride and acethylcholine. Rosenthal and Brown,[84] however, ascribed a selective antihistaminic action to this drug. A local anesthetic action was found to be another property of this substance. Rosenthal and Minard [85] cited this action in support of their contention that the sensation of cutaneous pain is the result of a local liberation of histamine.

The great toxicity of the phenolic ethers led Staub [86] to turn her attention to another series of Fourneau compounds having the ethylenediamine radical. Of the group she studied the most promising was:



N-phenyl-N-ethyl-N'-diethylethylenediamine or compound 1571 F

Compound 1571 F was antihistaminic and antianaphylactic and, according to Staub, had no effect on the cutaneous reaction to histamine. Among others, Wilcox and Seegal [87] studied this compound. By prior administration of 1 to 4 mg. of the drug to guinea pigs they obtained protection against two to six minimal lethal doses of histamine. The animals, however, showed pronounced toxic effects from the antagonist. Sensitized guinea pigs were fairly well protected against anaphylactic shock. The decreased coronary flow in the perfused heart of the guinea pig, due to the addition of histamine or the specific antigen was prevented by adding compound 1571 F to the perfusion fluid. The effect of compounds 929 F and 1571 F on gastric response to histamine or on food ingestion in dogs varies with the experimenters.[88]

From the experimental and preliminary clinical trial of compounds 929 F and 1571 F it was concluded that their toxicity was too great to warrant their use therapeutically.

RECENT FRENCH ANTIHISTAMINIC DRUGS (MOSNIER COMPOUNDS)

In 1942 Halpern [89] described his experimental observations with two of the most promising of a new series

74. Edlbacher, S.; Jucker, P., and Baur, H.: Die Beeinflussung der Darmreaktion des Histamins durch Aminosäuren, Ztschr. f. physiol. Chem. **247:** 63, 1937.

75. Ackermann, D., and Wasmuth, H.: Zur Kentniss der Beziehung des Histamins zum anaphylaktische Schock, Ztschr. f. physiol. Chem. **260:** 155, 1939.

76. Linneweh, F.: Ueber die Pathogenese und die Grundlagen zur Therapie der Säuglingsintoxication, Monatschr. f. Kinderh. **85:** 215, 1940.

77. Mackay, M.: Effect of Histidine on Histamine Content of Lungs and on Histamine Reactions, Australian J. Exper. Biol. & M. Sc. **16:** 137 (June) 1938.

78. Halpern, B. N.: Action du chlorhydrate d'histidine sur les organes à muscles lisses; antagonisme avec l'histamine, Compt. rend. Soc. de biol. **131:** 509, 1939.

79. Landau, S. W., and Gay, L. N.: Influence of Certain Amino Acids on Histamine Reactions and Anaphylactic Reactions in Intestinal Strips of Guinea Pigs and in Intact Guinea Pigs, Bull. Johns Hopkins Hosp. **74:** 55 (Jan.) 1944.

80. Fourneau, E., and Bovet, D.: Recherches sur l'action sympathicolytique d'un nouveau dérivé du dioxane, Arch. internat. de pharmacodyn. et de thérap. **46:** 178 (Oct. 15) 1933.

81. Bovet, D., and Maderini, P.: Action sympathicolytique de quelques amines à fonction étheroxyde phénolique, Compt. rend. Soc. de biol. **114:** 980, 1933.

82. Staub, A. M., and Bovet, D.: Action de la thymoxyethyldiethylamine (929F.) et des éthers phénoliques sur le choc anaphylactique du cobaye, Compt. rend. Soc. de biol. **125:** 818, 1937.

83. Climenko, D. R.; Homburger, E., and Messer, F. H.: Pharmacology of Thymoxyethyldiethylamine, J. Lab. & Clin. Med. **27:** 289 (Dec.) 1941.

84. Rosenthal, S. R., and Brown, M. L.: Thymoxyethyldiethylamine as an Antagonist of Histamine and of Anaphylactic Reactions, J. Immunol. **38:** 259 (April) 1940.

85. Rosenthal, S. R., and Minard, D.: Experiments on Histamine as the Chemical Mediator for Cutaneous Pain, J. Exper. Med. **70:** 415 (Oct.) 1939.

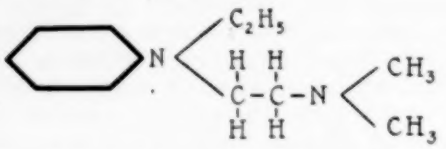
86. Staub, A. M.: Recherches sur quelques bases synthétiques antagonistes de l'histamine, Ann. Inst. Pasteur **63:** 400 (Oct.) 1939.

87. Wilcox, H. B., Jr., and Seegal, B. C.: Influence of an Ethylenediamine Derivative on Histamine Intoxication and Anaphylactic Shock in the Intact Guinea Pig and the Isolated Guinea Pig Heart, J. Immunol. **44:** 219 (July) 1942.

88. Bourque, J. E., and Loew, E. R.: The Effect of Histamine Antagonists on Gastric Secretion, Am. J. Physiol. **138:** 341 (Jan.) 1943. Hallenbeck, G. A.: Studies on the Effect of Thymoxyethyldiethylamine (929F) and N-Diethylaminoethyl-N-Ethylaniline on Gastric Secretion in the Dog, ibid. **139:** 329 (July) 1943.

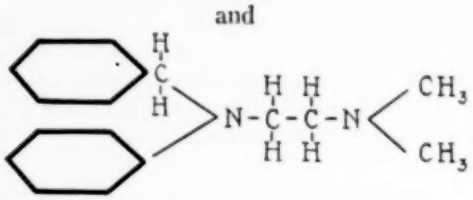
89. Halpern, B. N.: Etude expérimentale des antihistaminiques de synthèse: Essais de chimiothérapie des états allergiques, J. de méd. de Lyon **23:** 409 (July 20) 1942; Les antihistaminiques de synthèse: Essais de chimiothérapie des états allergiques, Arch. internat. de pharmacodyn. et de thérap. **68:** 339 (Dec. 31) 1942.

of compounds prepared by M. Mosnier in the chemical laboratories of the Rhone-Poulenc Society of Chemical Manufacturing. These were:



N'phenyl-N'ethyl-N-dimethylethylenediamine
(dimethylaminoethylaniline or compound 2325 RP)

and



N'phenyl-N'benzyl-N-dimethylethylenediamine
(dimethylaminoethylbenzylaniline, "Antergan" or compound 2339 RP)

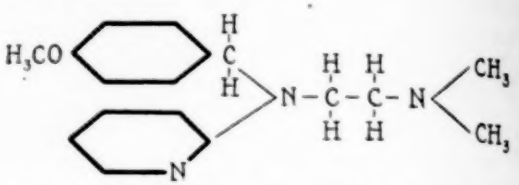
As will be noted, compound 2325 RP differs from 1571 F only in the substitution of a dimethyl for a diethyl group, while compound 2339 RP differs from 2325 RP in the substitution of a benzyl for the ethyl group.

Compound 2339 RP (Antergan) was found to be the more desirable, and Halpern concentrated his studies mainly on this drug. He found that shock and death from intravenous histamine and anaphylaxis could be prevented in the guinea pig by the previous administration of Antergan. The addition of small amounts of this drug to the bath prevented the histamine contraction of the intestinal strip of the guinea pig. Its comparative efficiency in such activity was as follows: 1571 F —0.1; 2325 RP —1.0; 2339 RP —15. In vitro contraction of the sensitized intestinal strip could be prevented either by the addition of the drug to the bath or by its administration to the intact animal. While Antergan had a slight inhibiting effect on the activity of acetylcholine or barium chloride its effect was much greater against histamine.

The administration of 1 mg. of Antergan per kilogram of body weight hypodermically prevented asthma in guinea pigs from aerosol histamine. In such action this compound was not only more effective than the other histamine anatagonists studied up to that time but considerably more effective than ephedrine or atropine. Epinephrine was most active, but its toxicity hampered its efficiency. In guinea pigs the LD-50 of Antergan (the dosage fatal to 50 per cent of the animals) was 175 mg. per kilogram of body weight hypodermically and 300 mg. orally. Toxic doses resulted in excitation and convulsions.

The results of therapeutic trials of Antergan began to appear in the European literature in 1942. Gaté and her co-workers [90] described favorable effects in a series of cases comprising urticaria, eczema, hay fever, perennial rhinitis, migraine, asthma, dermatitis medicamentosa and anal and vulvar pruritus. Good results against hay fever were emphasized by Sciclounoff and Junet,[91] but their results against asthma were not as good. Aubertin [92] stressed the efficacy of the drug in the urticarial dermatoses. Satisfactory results were also reported by others.[93] The daily intake of the drug varied from 200 to 1,500 mg. Parrot,[94] as well as others,[91] showed that the ingestion of large doses of Antergan inhibited the cutaneous whealing from histamine.

More recently a new ethylenediamine derivative was described by Bovet and his associates.[95] This is:



N-p-methoxybenzyl-N-dimethylaminoethyl α aminopyridine
(Neoantergan or compound 2786 RP)

This compound is claimed to be more effective and less toxic than Antergan. In guinea pigs a dose of 0.1 mg. per kilogram of body weight prevented death from five to ten lethal intravenous doses of histamine, while a dose of 1 mg. per kilogram of body weight protected against seventy-five lethal doses of histamine. The contraction of the intestinal strip produced by 1 to 10,000,000 dilutions of histamine was abolished by 1 to 100,000,000 dilutions of Neoantergan. The capillary permeability of the dog as the result of histamine was decidedly attenuated by this compound.[96] It is claimed by Decourt [97] that Neoantergan is more effective and less toxic than Antergan clinically, but according to a personal communication from Halpern, its advantage over Antergan clinically is based more on the fact that it may be better tolerated rather than that it is more active.

The experience of my associates and me with Neoantergan is as follows: In guinea pigs it was highly effective in the prevention of death from histamine and anaphylactic shock. In seasonal hay fever [98] the drug was of benefit to 39 of 60 patients (65 per cent); in perennial vasomotor rhinitis to 8 of 10 patients, and in asthma to 1 of 5 patients.

Recently, Halpern [99] has claimed that in experiments with another new compound he has been able to protect against twelve hundred to fifteen hundred lethal doses of histamine.

90. Gaté, J.; Thiers, H.; Cuilleret, P., and Pellerat, J.: Recherches sur l'action de nouveaux composés antihistaminiques de synthèse, J. de méd. de Lyon **23**: 401 (July 20) 1942.

91. Sciclounoff, F., and Junet, R.: Un nouvel antihistaminique de synthèse: L'antergan; contribution à l'étude clinique de la médication antiallergique, Rev. méd. de la Suisse Rom. **63**: 570 (July 25) 1943.

92. Aubertin, E.: Une nouvelle médication dans le traitement des maladies par hypersensibilité: Les antihistaminiques de synthèse, J. de méd. de Bourdeaux **119**: 606 (Oct. 15) 1942.

93. Decourt, P.: Traitment de l'asthme par des bases antagonistes de l'histamine, Presse méd. **50**: 773 (Dec. 19) 1942. Celice, J.; Perrault, M., and Durel, P.: Utilisation clinique des antihistaminiques de synthèse, Bull. et mém. Soc. méd. d. hôp. de Paris **58**: 284 (Sept. 22) 1942. Parrot, J. L.: Syndromes histaminiques et antagonistes de l'histamine, Presse méd. **50**: 771 (Dec. 19) 1942. Decourt, P.: Action de bases antagonistes de l'histamine sur quelques maladies liées à des réactions d'hypersensibilité, Bull. et mém. Soc. méd. d. hôp. de Paris **58**: 265 (Sept. 22) 1942.

94. Parrot, J. L.: Les modifications apportées par un antagoniste de l'histamine (2339RP) à la réaction vasculaire locale de la peau, Compt. rend. Soc. de biol. **136**: 715, 1942.

95. Bovet, D.; Horclois, R., and Walthert, F.: Propriétés antihistaminiques de la N-p-méthoxybenzyl-N-diméthylaminoéthyl α aminopyridine, Compt. rend. Soc. de biol. **138**: 99, 1944.

96. Bonvallet, M., and Decourt, P.: Action du 2786 RP sur l'augmentation de permeabilité des capillaires cutanés proboquée par une injection intradermique d'histamine, Compt. rend. Soc. de biol. **138**: 224, 1944.

97. Decourt, M. J.: Le medication antihistaminique, Semaine d. hôp. de Paris **21**: 707, 1945.

98. Bernstein, T. B.; Rose, J., and Feinberg, S. M.: New Antihistaminic Drugs in Hay Fever and Other Allergic Manifestations, to be published.

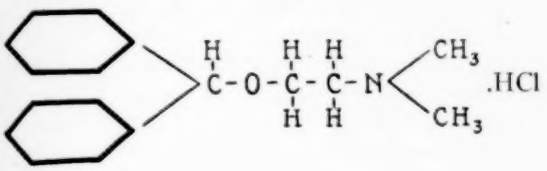
99. Halpern, B. N.: Personal communication to the author.

NEW AMERICAN HISTAMINE ANTAGONISTS

In the last few years intensive research has been conducted in pharmaceutical laboratories in this country in the attempt to find an effective and safe histamine antagonist for clinical use. As a result of this research two compounds have been made available for experimental and clinical trial. The experimental and therapeutic experience with these drugs by a number of workers, including me, will be described here. It should be kept in mind, however, that these products are not necessarily the final ones of their kind and that pharmaceutical institutions are continuing their quest for more potent and less toxic drugs.

BETA-DIMETHYLAMINOETHYL BENZOHYDRYL ETHER HYDROCHLORIDE (BENADRYL HYDROCHLORIDE)

This compound has the structural formula:



According to Loew and his associates,[100] Benadryl is two to four times more effective than compounds 929 F and 1571 F in preventing the death of guinea pigs from the inhalation of histamine. It was also effective in preventing death from histamine which was administered intravenously. In its antianaphylactic activity it was found at least as active as compound 1571 F. Wells and his co-workers [101] demonstrated that the activity of this histamine antagonist is directed to only a portion of the histamine. The injection of 10 mg. per kilogram of body weight of Benadryl in the dog prevented fatal anaphylactic shock and fatal histamine shock due to the injection of histamine in amounts comparable to those liberated from the liver in anaphylaxis.[102] This finding was advanced as an additional argument that histamine liberation plays a dominant role in anaphylactic shock.

Whealing.—One of the first questions that presented itself was: What effect does this drug have on histamine wheals? And if any diminution of the wheal occurs, does it have a similar action on the antigen-antibody wheal? Although the ingestion of 50 to 100 mg. of the drug resulted in the disappearance or diminution in the whealing of a series of patients with dermographism, the incidence of specific reactions with antigens by scratch tests indicated that there was a lack of practical interference with the antigen wheal.[103] Subsequently it was shown that [104] the oral use of the drug did not have any decisive effect on the whealing produced on scratch tests with serial dilutions of histamine or with ragweed extract in sensitive patients. When a solution of Benadryl was mixed with the histamine or ragweed extract, or when it was applied to scratches prior to the application of these wheal-producing agents, there was a dramatic inhibition of the whealing phenomenon.[104] Other whealing, such as that due to codeine, morphine, atropine, pilocarpine, bee venom and physostigmine, was also inhibited.[105]

Urticaria.—Urticaria and angioneurotic edema were the first manifestations reported to be relieved by this drug.[106] Friedlaender and I [107] found it to be effective in the urticarial dermatoses, as well as in dermographism, in the majority of patients treated. The good results in urticaria are confirmed by a number of workers.[108] The percentage of effective results varies somewhat with different authors, but all agree that about 80 per cent of the patients are benefited. The itching is almost always relieved, while the lesions are kept in abeyance in the majority of patients, although those in a few, particularly when the swellings have been of unusual size, may not be helped. The serum sickness type of reaction, particularly that following penicillin administration and consisting primarily of urticaria, itching and arthralgia, has been benefited in most instances except for the fact that the arthralgia has been more resistant. It should be emphasized that in the cases of urticarial and "serum sickness" reactions the relief was apparent for only a few hours following each dose of the medicament and that the final course of the ailment was in no way shortened or affected by this therapy.

Dermatitis.—In acute and chronic atopic dermatitis (flexural dermatitis, neurodermatitis) relief was noted from the itching in 20 out of 25 cases.[104] Other investigators have also observed such benefit.[108f,g] While the relief was directed primarily to combating the itching, the prevention of traumatization of the skin from scratching frequently resulted in salutary effects on the inflammatory process. In contact dermatitis the results were less striking. Pronounced relief of the itching of pruritus vulvae has also been noted.[104]

Hay Fever and Vasomotor Rhinitis.—In cases of hay fever, Koelsche and his associates [109] obtained relief in 75 per cent; Logan,[108d] in 75 per cent; Eyermann,[108e] in 67 per cent; Waldbott,[108f] in 74 per cent, and Levin,[108g] in 59 per cent. McElin and Horton [108b] also

100. Loew, E. R.; Kaiser, M. E., and Moore, V.: Synthetic Benzhydryl Alkamine Ethers Effective in Preventing Fatal Experimental Asthma in Guinea Pigs Exposed to Atomized Histamine, J. Pharmacol. & Exper. Therap. **83:** 120 (Feb.) 1945. Loew, E. R., and Kaiser, M. E.: Alleviation of Anaphylactic Shock in Guinea Pigs with Synthetic Benzhydryl Alkamine Ethers, Proc. Soc. Exper. Biol. & Med. **58:** 235 (March) 1945.

101. Wells, J. A.; Morris, H. C.; Bull, H. B., and Dragstedt, C. A.: Observations on the Nature of the Antagonism of Histamine by B-Dimethylaminoethyl Benzhydryl Ether (Benadryl), J. Pharmacol. & Exper. Therap. **85:** 122 (Oct.) 1945.

102. Wells, J. A.; Morris, H. C., and Dragstedt, C. A.: Modification of Anaphylaxis by Benadryl, Proc. Soc. Exper. Biol. & Med. **61:** 104 (Feb.) 1946.

103. Feinberg, S. M., and Friedlaender, S.: Relief of Dermographism and Other Urticarias of Histamine Origin by a Synthetic Benzhydryl Alkamine Ether, J. Allergy **16:** 296 (Nov.) 1945.

104. Friedlaender, S., and Feinberg, S. M.: Histamine Antagonists: III. The Effect of Oral and Local Use of B-Dimethylaminoethyl Benzhydryl Ether Hydrochloride on the Whealing Due to Histamine, Antigen-Antibody Reactions, and Other Whealing Mechanisms; Therapeutic Results in Allergic Manifestations, J. Allergy **17:** 129 (May) 1946.

105. Friedlaender, S., and Feinberg, S. M.: Histamine Antagonists: Effect on Various Whealing Phenomena, to be published.

106. Curtis, A. C., and Owens, B. B.: B-Dimethylaminoethyl Benzhydryl Ether HCl (Benadryl) in Treatment of Acute and Chronic Urticaria, Univ. Michigan Hosp. Bull. **11:** 25 (April) 1945.

107. Feinberg, S. M.: Histamine Antagonists: II. Summary of Developments in Non-Specific Inhibition of Histamine, Anaphylaxis and Allergy, J. Allergy **17:** 217 (July) 1946. Friedlaender and Feinberg, footnotes 103 and 104.

108. (*a*) Friedlaender, A. S.: The Use of a Histamine Antagonist, B-Dimethylaminoethyl Benzhydryl Ether Hydrochloride in Allergic Disease, Am. J. M. Sc. **212:** 185 (Aug.) 1946. (*b*) McElin, T. W., and Horton, B. T.: Clinical Observations on the Use of Benadryl: A New Antihistaminic Substance, Proc. Staff Meet., Mayo Clin. **20:** 417 (Nov. 14) 1945. (*c*) O'Leary, P. A., and Farber, E. M.: Benadryl in the Treatment of Urticaria, ibid. **20:** 429 (Nov. 14) 1945. (*d*) Logan, S. B.: The Use of Benadryl in Treating Some Allergic Diseases of Childhood, ibid. **20:** 436 (Nov. 14) 1945. (*e*) Eyermann, C. H.: Clinical Experiences with a New Antihistaminic Drug, J. Allergy **17:** 210 (July) 1946. (*f*) Waldbott, G. L.: Clinical Results with Benadryl, ibid. **17:** 142 (May) 1946. (*g*) Levin, S. L.: B-Dimethylaminoethyl Benzhydryl Ether Hydrochloride (Benadryl): Its Use in Allergic Diseases, ibid. **17:** 145 (May) 1946.

109. Koelsche, G. A.; Prickman, L. E., and Carryer, H. M.: The Symptomatic Treatment of Bronchial Asthma and Hay Fever with B-Dimethylaminoethyl Benzhydryl Ether Hydrochloride, J. Allergy **17:** 151 (May) 1946.

described benefit in hay fever, while A. Friedlaender [108a] observed but little benefit. The results in perennial vasomotor rhinitis were described by several workers.[110] The percentage of those benefited, where stated, varied from 28 to 85. In my own series [111] of 47 cases of perennial vasomotor rhinitis, symptomatic benefit was obtained in 7 (or 15 per cent), while 28 of 54 patients (52 per cent) with seasonal hay fever were helped. Logan and his associates [108d] claimed definite symptomatic improvement in 4 cases of hyperplastic ethmoiditis, with retraction and disappearance of the polypoid tissue and diminution or disappearance of the purulent discharge. The symptoms recurred, however, when the drug was discontinued.

Asthma.—Asthma is not benefited materially by Benadryl, according to some observers.[112] On the other hand, Eyermann [108e] claimed good results in 65 per cent of his asthma cases; Waldbott,[108f] in 43 per cent, and Levin,[108g] in 65 per cent. Koelsche and his co-workers [109] observed that relief was obtained in a greater percentage of patients with seasonal cases than in those with perennial cases. In my series of 50 cases of asthma, mainly of perennial etiology, definite relief of symptoms was observed in only 12 per cent. Levin [108g] emphasized the fact that in asthma caused or complicated by bacterial infection Benadryl was practically without effect. In cases of migraine the observations [113] have been more limited and there are not sufficient data as yet to allow any conclusions to be drawn. While in certain instances some relief may have been obtained, in others the headaches were definitely aggravated.

Administration and Reactions.—Benadryl is usually administered orally in 50 mg. capsules. In acute conditions individual doses of 50 mg. may be taken, while for persistent symptoms doses of 50 mg. four times a day may be used. Larger doses are not tolerated well by the majority of persons. In infants 10 to 20 mg. doses have been employed, and in children up to 8 or 10 years 25 mg. doses were used. Logan [108d] has found the effective dose in infants around 2 mg. per pound (454 Gm.) of body weight. The drug has also been used parenterally. I have noted that intramuscular injections of 10 mg. were apt to produce more intense action than did oral doses of 50 mg. McElin and Horton [108b] frequently employed intravenous injections.

The most common side reactions from Benadryl are drowsiness, lassitude and dizziness. These reactions are undoubtedly closely related and may be regarded as the result of a depression of the higher centers. To some degree these symptoms are present in more than 50 per cent of persons. In many they are of a minor degree and in others this effect is lessened or lost in one or two days. Many patients, however, have sufficient sleepiness to interfere seriously with their ordinary activities, and the drug has to be discontinued. Other side effects have been dryness of the mouth and nose, hot flushes, nausea, insomnia and aggravation of an existing headache or asthma.[113]

110. Williams, H. L.: Use of Benadryl in the Syndrome of Physical Allergy of the Head: A Preliminary Report, Proc. Staff Meet., Mayo Clin. **20**: 434 (Nov. 14) 1945. Friedlaender and Feinberg.[108a] McElin and Horton.[108b] Logan[108d] Waldbott.[108f] Levin.[108g]

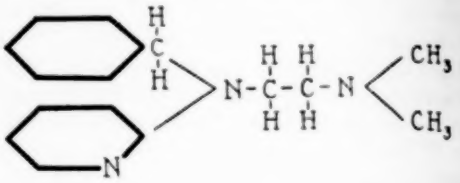
111. Feinberg, S. M.: Allergy in Practice, ed. 2, Chicago, the Year Book Publishers, Inc., 1946.

112. Friedlaender and Feinberg, footnotes 104, 107 and 108a. McElin and Horton.[108b]

113. Waldbott.[108f] Levin.[108g] Feinberg.[111]

PYRIBENZAMINE (N'PYRIDIL-N'BENZYL-N-DIMETHYLETHYLENEDIAMINE)

This compound has the structural formula:



It will be observed that pyribenzamine differs from Antergan only in the substitution of the pyridil for the phenyl ring, and from Neoantergan by the omission of the methoxy group. These slight alterations, nevertheless, suffice to modify the action of these drugs.

Pyribenzamine was found by Mayer and his associates [114] to be the most promising of a series of histamine antagonists which they studied. In experiments on asthma and convulsions produced in guinea pigs by the inhalation of histamine, it was found that the subcutaneous injection of 0.1 mg. per kilogram of body weight of pyribenzamine was as effective a preventive as 1.0 mg. per kilogram of body weight of Antergan. According to Mayer,[115] subcutaneous injection of 5 mg. per kilogram of body weight of Pyribenzamine protected against sixty to one hundred and twenty lethal doses of histamine given intravenously. In comparison with the protective effect of similar amounts of other antagonists, the figures obtained were as follows: 929 F, three lethal doses; 1571 F, four to six lethal doses; 2325 RP, eight to ten lethal doses, and 2339 RP (Antergan), forty lethal doses.

Mayer [115] also reported that a concentration of 0.02 microgram per cubic centimeter of Pyribenzamine was capable of preventing the contraction of the guinea pig intestine from histamine diphosphate in concentrations up to 1.0 microgram per cubic centimeter. Its anti-acetylcholine action was of a much lower order. Although Pyribenzamine has a definite oxytocic action its antihistaminic activity is much higher, and as a result it can be shown that 10 to 50 micrograms per cubic centimeter of Pyribenzamine prevents the histamine contraction of the guinea pig uterus. Mayer has stated further that Pyribenzamine in subcutaneous doses of 0.1 mg. per kilogram of body weight will protect guinea pigs against anaphylactic death.

It has been shown by Yonkman and his associates [116] that in the dog a dose of 3.5 mg. of Pyribenzamine per kilogram of body weight is sufficient to protect against anaphylaxis. The maximum tolerated doses of the drug, according to Yonkman,[117] are 20 mg. or more per kilogram of body weight in the guinea pig. Toxic doses produced excitation up to the point of convulsive seizure. Concentrated solutions administered hypodermically produced local necrosis of tissue. As a further pharmacologic action of Pyribenzamine, it was shown that it had an inhibiting action on histamine salivation in

114. Mayer, R. L.; Huttner, C. P., and Scholz, C. R.: Antihistaminic and Anaphylactic Activity of Some a-Pyridinoethylenediamines, Science **102**: 93 (July 27) 1945.

115. Mayer, R. L.: Antihistaminic Substances with Special Reference to Pyribenzamine, J. Allergy **17**: 153 (May) 1946.

116. Yonkman, F. F.; Hays, H. W., and Rennick, B.: The Protective Action of N'-Pyridyl-N'-Benzyl-N-Dimethylethylenediamine HCL (63 C) Against Horse Serum Anaphylaxis in Dogs, Federation Proc. **4**: 144 (March) 1945.

117. Yonkman, F. F.: Personal communication to the author.

cats[118] and that it prevented histamine whealing in rabbits.[119]

Whealing Phenomena.—In experiments on whealing in man Friedlaender and I[120] have found that Pyribenzamine has an action similar to, and probably more potent than, that of Benadryl. This inhibiting action on whealing was best noted when a solution of the drug applied locally was effective in inhibiting the whealing phenomena of histamine, specific antigen reactions, the specific reactions in passively sensitized sites, codeine, atropine, physostigmine, pilocarpine and bee venom.

Urticarial Dermatoses.—Arbesman and his associates[121] were the first to conduct therapeutic trials with Pyribenzamine. In acute urticaria they obtained relief in 93 per cent of patients, while in chronic urticaria 75 per cent were benefited. In a series of 37 patients with urticaria and angioneurotic edema whom we[122] treated with Pyribenzamine 29, or 78 per cent, obtained satisfactory relief. The majority of our cases were of the chronic type and we saw no particular difference between the response of the acute and chronic forms of urticaria. In some instances of angioneurotic edema, particularly those with huge swellings, larger doses (100 mg.) of the drug were required. In some instances the lesions were not as well controlled as the itching. In 6 cases of the serum sickness type caused by penicillin and in 2 caused by sulfonamide compounds, relief from itching and swelling was obtained, but the arthralgia was less responsive to this medicament. Results were also obtained in urticarial dermatoses caused by barbiturate compounds. Pyribenzamine was also effective in the relief of dermographism or urticaria factitia.

Dermatitis.—Pyribenzamine was found by us to be effective in the relief of itching in acute and chronic atopic dermatitis in 16 of 20 patients: the relief of the itching and the resulting scratching frequently was responsible in producing improvement in the cutaneous lesions. However, curative action was not noted. Pruritus vulvae and pruritus ani were also controlled symptomatically. Contact dermatitis was less responsive to the drug.

Hay Fever and Vasomotor Rhinitis.—According to Arbesman and his co-workers[121] the drug produced improvement in 85 per cent of patients with seasonal hay fever and 58 per cent of vasomotor rhinitis. In our[122] group of 254 hay fever patients 210, or 82 per cent, showed benefit, while in 130 patients with vasomotor rhinitis 64 per cent were benefited. The sneezing and rhinorrhea as well as the nasal blocking were relieved. Relief with Pyribenzamine was more noticeable in those who had had desensitizing treatment. Many of the patients listed as relieved were not helped by the drug when the symptoms became more severe. Since the 1946 ragweed season was unusually mild, it is not unlikely that in more severe hay fever seasons relief obtained by use of these drugs would be less. The persistent blockage of the nose experienced by some patients at any time of the season and by others toward the end of the season was influenced little by the use of these drugs. In 2 patients with decided nasal blocking due to the rebound action from nasal vasoconstrictors, the first dose of Pyribenzamine produced dramatic relief. The patients with seasonal hay fever included those who were sensitive to grass pollen, oak pollen, fungi and ragweed. Relief was usually noted in one-half to one hour following the first dose, although in some instances benefit was apparent only after two or three doses of the drug had been taken. It was noted by Arbesman's group of investigators as well as by my associates and myself that Pyribenzamine combined with ephedrine or aminophylline frequently was more effective than any one drug alone.

Asthma.—Benefit in asthma was noted by Arbesman and his associates[121] in 46 per cent of their seasonal cases and 37 per cent of the chronic type. In our series of 121 patients with asthma or allergic bronchial cough, 34 (or 28 per cent) were definitely benefited. The practically complete and rapid relief of the asthmatic attack obtainable from the use of epinephrine hypodermically was not noted with that of Pyribenzamine orally. Where relief was present it was usually only moderate. Spasmodic allergic cough was benefited more than dyspnea. It is well to remember that the asthma accompanying hay fever was seldom prevented by the use of the drug.

Miscellaneous Conditions.—In some instances of migraine, Pyribenzamine produced some relief, but its action in these cases was by no means consistent. In acute gastrointestinal upsets from food allergy, there was indication of benefit. We have observed also that in patients undergoing specific desensitization therapy the tendency to repeated constitutional reactions evident in a select few could, for the most part, be prevented by the administration of a dose of the drug prior to the specific treatment. This, however, does not mean that the patient is relieved from all symptoms of reaction or that he is secure from reactions due to large increments of antigen. Arbesman and his associates have also noted the ability of Pyribenzamine to prevent constitutional reactions.

Side Reactions.—Reactions other than the therapeutic effects desired are fairly common, but on the whole they are neither severe nor serious. The presence or absence of reactions was recorded in 598 patients. Out of this number 127 (or 23 per cent) admitted or complained of side reactions. Drowsiness and lassitude were observed in 18 per cent; dizziness in 13 per cent; nervousness or insomnia in 10 per cent; dryness of the mouth, throat or nose in 8 per cent and palpitation in 5 per cent. Other occasional side reactions were headache, burning on urination, gastric irritation, hypotension, diarrhea and tightness in the chest. The side effects in the vast majority of instances were moderate. In a few they were sufficiently intense, however, to prevent the patient from continuing the use of the drug.

Pyribenzamine was usually administered orally in 50 mg. doses three or four times a day. In some instances 100 mg. doses were effective when the smaller doses failed. In other instances 25 mg. doses were

118. Yonkman, F. F.; Chess, D.; Mathiesen, D., and Hansen, N.: The Antihistaminic Action of N'-Pyridyl-N'-Benzyl-N-Dimethylethylenediamine HCL (63 C) in Relation to Salivation, Retraction of the Nictitating Membrane, Mydriasis, Lachrymation, and Blood Pressure in Cats, Federation Proc. **4**: 143 (March) 1945.

119. Rennick, B.; Chess, D.; Hays, H. W.; Mathiesen, D.; Mayer, R. L., and Yonkman, F. F.: The Antianaphylactic and Antihistaminic Activity and Toxicity of N'-Pyridyl-N'-Benzyl-N-Dimethylethylenediamine HCL, Federation Proc. **4**: 133 (March) 1945.

120. Friedlaender and Feinberg, footnotes 104 and 105.

121. Arbesman, C. E.; Koepf, G. F., and Miller, G. E.: Some Antianaphylactic and Antihistaminic Properties of N'Pyridil-N'Benzyldimethylethylenediamine Monohydrochloride (Pyribenzamine), J. Allergy **17**: 203 (July) 1946.

122. Feinberg, S. M., and Friedlaender, S.: Histamine Antagonists: IV. Pyribenzamine in Symptomatic Treatment of Allergic Diseases, Am. J. M. Sc., to be published. Feinberg.[111]

sufficiently effective. Children tolerated proportionately higher amounts than would be expected, most of them taking 25 to 50 mg. doses. The medicament was given in tablet form, preferably not on an empty stomach. In many instances where the allergic manifestation was not continuous, individual doses were taken as needed.

COMPARATIVE STUDIES

A comparative experimental and clinical study of the histamine antagonists currently proposed for clinical use was needed. We felt that these observations made on all the drugs by the same experimenters and by the same technics and standards should give valuable data. The drugs subjected to these studies were: Antergan, Neoantergan, Benadryl and Pyribenzamine.

Whealing from urticariogenic agents on the human skin was inhibited by all antagonists, but apparently Pyribenzamine and Neoantergan were the most potent in that respect.[105] Experiments were performed [123] on the effect of a standard dose (3 mg. per kilogram of body weight) of the drug in the prevention of death from histamine injected intravenously in the guinea pig. As compared with 0.4 mg. of histamine base per kilogram of body weight which was fatal to all unprotected animals, the following amounts of histamine were required to produce fatal reactions in all animals under the influence of the histamine antagonists (3 mg. per kilogram): Benadryl, 2.0 mg.; Antergan, 2.4 mg.; Pyribenzamine, 15.0 mg.; and Neoantergan, 50.0 mg. In numerous experiments with injections of histamine there was no indication that these injections conferred any degree of histamine tolerance to the animals.

Experiments on the protective effect of the various drugs in anaphylactic shock [124] have not indicated comparable differences in activity such as were found in the case of antihistaminic action. However, this phase of the work, together with studies being made on antianaphylactic and antihistaminic activity of the drugs in vitro and studies being made on toxicity will be reported at a later time.

In our therapeutic trials we employed chiefly Benadryl and Pyribenzamine. In the urticarial dermatoses, in atopic dermatitis and in the serum sickness type of reactions from penicillin and sulfonamide drugs, Benadryl and Pyribenzamine were fairly equal in their effectiveness. Occasionally one or the other was more effective. When Benadryl produced better results it was almost always in those instances where the additional sedative effect of the drug was an advantage. There were some patients who obtained inconsiderable results with Benadryl but had decided benefit from Pyribenzamine. In most of these the advantage was due mainly to the fact that larger doses of Pyribenzamine than of Benadryl could be tolerated.

The outstanding difference in clinical effectiveness between the two drugs occurred in the allergic manifestations of the respiratory tract. In perennial vasomotor rhinitis benadryl gave relief to 15 per cent of the patients, while Pyribenzamine [122] was of benefit to 64 per cent. In the seasonal hay fever series the advantage was also in favor of Pyribenzamine; 82 per cent of the patients were helped with Pyribenzamine and 52 per cent with Benadryl. In 52 patients with perennial or seasonal allergic rhinitis in whom both drugs were tried, comparisons could be made. Thirteen were helped by both. In 24 relief was obtained by the use of Pyribenzamine without any appreciable effect from Benadryl, while in 6 the Benadryl was more effective. In asthma or allergic cough Benadryl gave some measure of relief in 10 per cent, while Pyribenzamine helped 28 per cent. In 34 patients in whom a clinical comparison of both drugs was made, 23 did not obtain relief from either drug, while 4 were helped by both. In 7 who were not benefited by Benadryl, Pyribenzamine gave some relief. There was not one case that was pyribenzamine-resistant in which relief was obtained by the use of Benadryl. It should be emphasized again that with either drug the relief was not of the order usually obtained with ephedrine or epinephrine. However, in some patients who failed to respond or responded only partially to the sympathomimetic drugs, Benadryl and Pyribenzamine were of some aid.

In 44 patients with respiratory allergy, chiefly ragweed hay fever, comparison was made between the effectiveness of Pyribenzamine and Neoantergan. In 9 no response was obtained from either drug. In 11 both drugs were equally effective. In 17 the results were in favor of Pyribenzamine, while in 7 Neoantergan was favored. Doses of 100 to 200 mg. of Neoantergan were required for therapeutic effect, but toxic reactions were less frequent with this drug.

A comparison of the side effects of these two drugs gives the following impressions. More than half of the patients taking 50 mg. doses of Benadryl complain of untoward effects, among which sleepiness is the outstanding reaction. In a good many instances this complaint of lassitude or dizziness is of such magnitude as to make it impractical to continue the therapy. The side reactions from Pyribenzamine occur in less than 25 per cent of the patients and are of a milder order than those from Benadryl. Slight drowsiness is about the most commonly observed effect, but it is infrequently of the degree obtained with Benadryl. It is interesting to note that those patients who observed a sedative effect from the use of Pyribenzamine found that this effect was invariably more pronounced when Benadryl was administered. In only a relatively few was the use of Pyribenzamine contraindicated because of its side reactions. One of the greatest advantages of this drug over Benadryl is that the toleration of larger doses of Pyribenzamine (100 to 150 mg.) enables one to obtain results in some cases where the smaller doses of Benadryl (50 mg.) are not effective.

COMMENT

The general subject of the antihistaminic drugs is reviewed in several articles.[125] A new era in the field of antihistaminic and antiallergic actions is rapidly developing. There are now available drugs which experimentally can be shown to have antihistaminic and antianaphylactic efficiency and a fair degree of pallia-

123. (*a*) Friedlaender, S.; Feinberg, S. M., and Feinberg, A. R.: Histamine Antagonists: V. Comparative Study of Benadryl and Pyribenzamine in Histamine and Anaphylactic Shock, Proc. Soc. Exper. Biol. & Med. **6**: 65 (May) 1946. (*b*) Friedlaender, S.; Feinberg, A. R., and Feinberg, S. M.: Comparative Antihistaminic Activity of New Ethylenediamine Drugs in the Guinea Pig, to be published.

124. Rose, J.; Feinberg, A. R.; Friedlaender, S., and Feinberg, S. M.: Histamine Antagonists: Comparative Antianaphylactic Activity of New Ethylenediamine Drugs in the Guinea Pig, to be published.

125. Code, C. F.: A Discussion of Benadryl as an Antihistaminic Substance, Proc. Staff Meet., Mayo Clin. **20**: 439 (Nov. 14) 1945. Feinberg, footnotes 107 and 111.

tive usefulness against allergic manifestations. It should be distinctly understood that these drugs do not immunize the patient or protect him from the effects of the allergic reaction for any extensive period. To the best of our knowledge these drugs operate by competing with the liberated histamine in their attachment to the receptor cell. Therefore, the benefit is only symptomatic and lasts only for a few hours from each dose of the medicament.[126] It is important for the allergic person to continue with his allergic management and with his specific desensitizing program where indicated. It is likely that the employment of desensitization combined with the use of histamine antagonists during the stage of active allergic symptoms may be better than the use of either treatment regimen alone.

Although the preliminary experimental observations of others would indicate that the antagonists of histamine do not interfere with the antigen-antibody reaction or with desensitization, this question has not been conclusively settled. It is important to keep in mind that further investigation may possibly show that while the patient is being helped temporarily by one of these drugs the long term program of creating immunity may be interfered with by the same drug. The immediate side reactions from these drugs may be a handicap in their use. The remote toxic effects have not yet been sufficiently studied. In the past, the toxic reactions of new drugs in many instances have not been apparent for a considerable period after their widespread use.

The currently available histamine antagonists are not ideal. They do not work in all types of allergic manifestations, nor are they of help in all cases of any particular syndrome. The side reactions limit the size of the doses. It is likely that within the near future more potent and less toxic histamine antagonists will emerge and be able to overcome some of these difficulties. On the other hand, it must be admitted that since it is not definitely known that histamine release is the only injurious effect of the allergic reactions, even the most potent antagonists of histamine may fail to be completely effective in the relief of allergic manifestations. There is also the possibility that other means will be found to combat the problem of allergy, among which is the inhibition of the antigen-antibody reaction or the prevention of the release of toxic substances in such reactions.

In this connection it is well to realize that allergic manifestations are prone to cyclic changes and periodicities, varying from hour to hour, day to day, week to week and season to season. For this and other reasons misinterpretation is frequent in the evaluation of the efficacy of remedies in allergy. The following criteria are suggested to test the effectiveness of a symptomatic remedy in allergic disease:

1. Unquestioned relief of symptoms must be obtained on the administration of the drug on repeated occasions.

2. Recurrence of symptoms should follow the discontinuance of the medicament.

3. The relief should be obtained under sufficiently controlled conditions and under varying circumstances so that it cannot be attributed to normal fluctuations in tolerance or to external factors, such as weather or pollen concentration. (The 1946 ragweed season was unusually mild.)

4. Whenever possible (urticaria, hay fever and asthma) objective changes should confirm subjective claims.

5. Placebo medication should fail to produce relief.

126. Report of the Committee on Pharmaceuticals and Medicaments of the American Academy of Allergy, J. Allergy **17**: 325 (Sept.) 1946.

SUMMARY

The recognition of the role of histamine in the mechanism of anaphylaxis and its probable role in allergy has led to various attempts to diminish the action of this poison. That an increase in tolerance to histamine cannot be expected from injections of histamine is supported by the preponderance of experimental evidence in animals and man. The enzyme histaminase lacks an inhibiting or neutralizing effect on histamine in the living animal and does not exert a specific action on anaphylaxis or allergy. The evidence for an increased tolerance to histamine and for a resulting specific antiallergic action from the injection of histamine-azoprotein is doubtful.

In the last few years histamine antagonists of various types have been tried in histamine shock, anaphylaxis and allergy. The amino acids, histidine, cysteine and arginine, were found too weak in their action and too toxic. The early French synthetic compounds proved fairly active in histamine and anaphylactic reactions but were too toxic for clinical use.

The more recent antagonists of histamine are chemically related and have some degree of clinical usefulness. These are the French compounds Antergan (N'phenyl-N'benzyl-N-dimethylethylenediamine) and Neoantergan (N-p-methoxybenzyl-N-dimethylaminoethyl *a* aminopyridine) and the American compounds Benadryl (B-dimethylamino ethyl benzhydryl ether) and Pyribenzamine (N'pyridil-N'benzyl-N-dimethylethylenediamine). Benadryl and Pyribenzamine are useful symptomatic remedies in the treatment of the urticarial dermatoses, atopic dermatitis (flexural and infantile atopic eczema), reactions to penicillin and sulfonamide, some other types of dermatitis and seasonal hay fever. In the latter syndrome the order of effectiveness of the antihistaminic drugs is: Pyribenzamine, Neoantergan and Benadryl.

The usefulness of Benadryl and Pyribenzamine against perennial vasomotor rhinitis and asthma is more limited. The evidence thus far indicates that Pyribenzamine is the more effective of the two drugs against these manifestations.

Both drugs give a high incidence of side reactions, among which sedation and drowsiness are most commonly observed. These reactions are more frequent and of greater intensity in the case of Benadryl.

The use of these histamine antagonists should be tempered with the following considerations: A cure or lasting improvement is not to be anticipated as a result of the action of these drugs; at best they exert only a temporary palliative action in allergic conditions. Many manifestations and many patients will fail to respond to them, and others will be helped by the employment of additional palliative measures. The specific allergic methods (elimination and desensitization) should not be abandoned, as at present they constitute the sole means of achieving lasting results. In addition to precautions against immediate toxic reactions, it should be remembered that the remote toxicity from these drugs has not been sufficiently ascertained up to this time.

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SATURDAY, NOVEMBER 23, 1946

THE BRUTALITIES OF NAZI PHYSICIANS

On December 5 a new series of Nürnberg trials will begin, this time involving twenty-three Nazi physicians who are charged with the crime of having conducted experiments on human beings resulting in innumerable deaths. A few months ago at the request of the federal government the Board of Trustees of the American Medical Association delegated Dr. A. C. Ivy, vice president of the University of Illinois, to represent the Association in an investigation of these acts of inhumanity, as a member of a group that will present evidence at the trials. On his return to the United States Dr. Ivy made his report to the government and at the same time directed a copy to the Board of Trustees. The report was referred by the Board of Trustees to the Judicial Council of the Association, with a request that it be presented to the meeting of the House of Delegates to be held in Chicago December 9-11. Thus there will become available an official statement from the House of Delegates regarding its attitude toward the acts committed by these German physicians.

Since the earliest times society has expected of the physician a standard of conduct compatible with the nature of his profession. "The Principles of Medical Ethics" say "A physician should be 'an upright man, instructed in the art of healing.' Consequently, he must keep himself pure in character and conform to a high standard of morals, . . ."

The report of the Mission to the European Theater Concerning War Crimes of a Medical Nature showed that certain German physicians and scientists were involved in the perpetration of both nonexperimental and experimental crimes and barbarities. The nonexperimental crimes included mass killings of persons who were about to die from disease, malnutrition and old age. Poor workers were placed on a hunger diet and when they became weakened from malnutrition were killed. Mass killings were practiced to make more room in overcrowded concentration camps and prisons. Hundreds of thousands of gypsies, Poles and Russians were killed by exposure to the fumes of potassium cyanide and the intravenous injection of cresol, chloral, veronal, morphine and scopolamine as a part of the technic for exterminating other people in order to make more room for Germans. One series of murders was done to provide skeletons for an anthropological museum. Operations were done on human beings as part of the procedure in training students in surgical technics. The selection of persons to be killed was done by physicians, and the killing was done under their supervision.

These brutalities were supplemented by a series of experiments on human beings such as have never before occurred in the history of the world. Medical science has been advanced in our own country and in some other countries by experiments on human beings who volunteered for the purpose. Conspicuous were the volunteers in the transmission of yellow fever in Cuba, the prisoners in Mississippi who volunteered for experiments in pellagra and those in Colorado who volunteered for experiments with tuberculosis. During the war just ended great numbers of our soldiers volunteered for experiments with malaria, influenza and other infectious diseases. In every instance the right of the human being to determine for himself whether or not he would participate was recognized. In the American army the tradition is well established that human beings, even under military conditions, are not ordered to submit to procedures that violate the sanctity of their own persons. The medical profession of our country in accordance with its traditions would support any medical officer who would refuse to obey an order from a line officer which would violate the sanctity of any human being, if any line officer should give such an order. Neither would the American tradition require a physician to debase himself or his profession by participating in such a performance even at the behest of the highest political leaders.

The records clearly establish that certain Nazi physicians performed experiments on human subjects without their consent and with complete disregard for their human rights. These experiments were often conducted with unnecessary suffering and injury, and death was a certain outcome. Some of the experiments were sadistic and were performed by pseudoscientists and untrained personnel without adequate reason. Apparently seventy physicians and scientists were involved, although there may have been many more. Three well known scientists have been indicted, the most prominent being Dr. Sigmund Schilling, whose name has been associated with study on the blood.

The report to the Secretary of War by Dr. Ivy lists the following experiments:

1. The injection of virulent typhus into a nonimmunized control group of human subjects.

2. The introduction of living tuberculosis germs into the trachea.

3. The study of remedies for phosphorus burns of the skin.

4. The excision of the ligaments of muscles about the joint to ascertain the extent of functional impairment.

5. The shortening of a limb by the excision of a section of bone to ascertain how much bone may be removed without impairment of function.

6. The incomplete removal of a longitudinal section of bone to ascertain how much weight the remnant will support.

7. The transplantation of tissues of various types. Attempts were made to transplant legs and other organs which animal experimentation has shown to be impracticable. In one instance a piece of "hair-growing skin" was transplanted to the nose of a Jewess.

8. In several different experiments virulent germs, including the "gas gangrene" producing bacillus, were injected into the leg muscles, and various types of chemotherapeutic and surgical treatments were employed at different stages of the infection to ascertain the best treatment. In one experiment pieces of leg muscle were rendered ischemic and traumatized to render the "gas bacillus" more virulent.

9. A study was made to ascertain how best to rewarm a subject whose body temperature was reduced to a low level (75 to 80 F.) by exposure to "wet cold" (cold water) and "dry cold" (cold atmosphere). Frostbite also was produced in another series of experiments.

10. Some experiments were done in which rupture of the uterus was produced.

11. Experiments on artificial insemination with subsequent artificial abortion were performed.

12. An attempt was made to produce multiple ovulation and conception with the idea of increasing the rate of reproduction of the herrenvolk. Indecencies characterized these experiments.

13. Studies were made to ascertain how a population could be sterilized without their knowledge, so that the sterilization could be accomplished without the fact becoming available for propaganda by the enemies of the reich. Castration by ordinary methods was too open. One method under study was to place the dried juice of a plant in the food of the population. Another method under study was to expose men and women to a castration dose of x-rays while they were filling out governmental forms. A third method consisted in injecting the cavity of the uterus with a sterilizing agent during the course of a routine physical examination of the women of the population. Even the number of women that could be sterilized in one day by one assistant was estimated.

14. The pathologic changes caused by and the lethality of "war gases" were apparently studied.

15. Experiments on explosive decompression were performed. The subjects were suddenly exposed to an altitude of 40,000 feet in an altitude chamber and kept there for twenty or thirty minutes without oxygen. This, of course, killed the subjects, and then autopsies were performed at altitude to search for gas bubbles in the blood vessels and tissues.

16. The lethal effects of poisoned bullets were studied to ascertain particularly the time of onset of symptoms of poisoning and how long the person wounded by the poisoned bullet would live.

THE JOURNAL has commented previously on the experiments with frozen men in which nude young women were forced to lie next to them in an attempt to encourage recovery. The foreign correspondents of THE JOURNAL have reported investigations made by leaders of medicine in other countries which substantiate fully the list of experiments described in the Ivy report.

Obviously, all of these experiments involving brutality, torture and murder were done without any basis in any laws either of Germany or of the Hague Convention. Certainly such experiments are contrary to the laws of humanity and the ethical practices of the medical profession which have prevailed for more than twenty centuries. These experiments were done without the consent of the human beings who were the subjects; they were done frequently without any adequate scientific reason; they were done often by people not qualified, and they were done in many instances with certain knowledge that the experiments might lead to permanent disability or death. Not the slightest good has resulted to mankind from these experiments. The basic sciences and medicine languished in Germany during the period of the war more than in any other country.

Perhaps most serious of all is the failure of German medical organizations and societies to express in any manner their disapproval of these widely known experiments. Physicians have a right to expect that men trained in the traditions of medicine would refuse to participate in any way in such acts of inhumanity and brutality. In some instances the defense has been offered that these experiments were conducted under the highest authority of the German state. That cannot possibly be considered in the slightest an extenuation of the failure of these physicians to act in accordance with the principles and traditions of their profession. Robert Burns wrote many years ago "Man's inhumanity to man makes countless thousands mourn." The inhumanity of these German physicians has stirred horror and disgust among physicians of every other nation of the world. From no other medical profession has there come evidence of anything resembling these sadistic procedures perpetrated in the name of science and camouflaged by a mask of research.

POLIOMYELITIS PORT OF ENTRY

Thirty-five years have passed since Flexner,[1] after initial animal experiments, suggested that the nasal mucosa, or, more correctly, the olfactory cells and nares, constitute the normal gateway through which poliomyelitis virus gains access to the central nervous system of man. Doubt gradually developed, following failure of local applications of alum or picric acid [2] to reduce the incidence of poliomyelitis in several outbreaks. Various potential pathways of infection other than the olfactory nerves were subsequently suggested, such as entrance through the taste buds [3] or other terminals of the ninth and tenth nerves,[4] through the abdominal sympathetics [5] or through the intrinsic ganglions of the intestine, with centripetal spread through the vagus.[6]

At present agreement is almost unanimous by those who have investigated human material that the olfactory nerve system is rarely involved. Kessel and his associates,[7] for example, found virus in only one olfactory bulb out of 11 fatal cases studied. There is, however, no unanimity of opinion as to which of the other suggested ports of entry play a dominant part. Statistical evidence toward a solution of this problem has been recently reported by Faber and his associates [8] of the Department of Pediatrics, Stanford University School of Medicine.

The San Francisco pediatricians made detailed microscopic studies of lesions in the nervous system in a series of 8 fatal cases occurring during 1943 and 1944 in the San Francisco Bay area. The cases were typical, and the diagnosis was confirmed in all but 1 instance by transmission of the disease to rhesus monkeys. All the patients died between the third and the ninth day from the effects of the disease, excepting 1 patient, who died on the twenty-fifth day from perforation of the esophagus.

Faber concludes that there appears to be no single port of entry in human poliomyelitis. Almost any nerve system with peripheral endings in the mucous surfaces can, if exposed, convey the virus in a central direction to its regional ganglions and thence, if the process continues, into the central nervous system. Their limited statistical evidence suggests the following relative frequencies of primary infection: (*a*) trigeminal afferent system (fifth cranial) very frequent, (*b*) visceral afferent system (ninth and tenth cranial) fairly common but less than the fifth, (*c*) gustatory system (seventh, ninth and tenth cranial) occasional, (*d*) sympathetic systems, upper levels (pharynx, bronchial tree, upper esophagus) occasional, (*e*) sympathetic system, lower (intestine) doubtful and (*f*) vagal efferent (parasympathetic) system (ninth cranial) and olfactory (first cranial) system uninvolved.

The pharynx thus appears to be an especially favorable site for the primary penetration of poliomyelitis virus into the body. Clinically there is apparently no constant correlation between the site (or level) of the initial penetration and the site or severity of the initial paralysis.

1. Flexner, Simon, and Lewis, P. A.: Epidemic Poliomyelitis in Monkeys, J. A. M. A. **54**: 535 (Feb. 12) 1910.
2. Armstrong, Charles, and Harrison, W. T.: Pub. Health Rep. **50**: 725 (May 31) 1935; **51**: 203 (Feb. 28) 1936.
3. Drinker, C. K.: Virus and Rickettsial Diseases, Cambridge, Mass., Harvard University Press, 1940, p. 387.
4. Goodpasture, E. W.: Am. J. Path. **1**: 29 (Jan.) 1925.
5. Kling, C.; Levaditi, C., and Lépine, P.: Bull. Acad. Méd., Paris **102**: 158.
6. Marinesco, G.; Manacatide, M., and Stati-Draganesco: Ann. Inst. Pasteur **43**:223 (Feb.) 1929.
7. Kessel, J. F.; Moore, F. J.; Stimpert, F. D., and Fisk, R. T.: J. Exper. Med. **74**: 601 (Dec.) 1941.
8. Faber, H. K., and Silverberg, Rosalie J.: J. Exper. Med. **83**:329 (April) 1946.

DIET AND MAN'S TOLERANCE TO COLD

The possibility that human tolerance to cold may be affected by diet, particularly by the water soluble vitamins, has been a matter of conjecture for many years. Recently a comprehensive study of the question has been reported [1] by a group of investigators at the University of Illinois. Twelve healthy young men were used as subjects. Experiments were conducted for a period of one hundred and fifty days to determine the effect of supplements of the water soluble vitamins to a basal diet containing only borderline amounts of ascorbic acid, thiamine, riboflavin and niacin on the ability of the subjects to withstand repeated exposure to cold. The exposure was of eight hours' duration either to intense cold (— 20 F.) with considerable protective clothing or to a cool environment (60 F.) with little protective clothing. The tolerance to cold was measured by changes in rectal and mean skin temperature and in the performance of a series of psychomotor, perceptual and intellective tests. The supplementary vitamins were alternated with placebos indistinguishable from the vitamin capsules.

After eighty-nine days the subjects fed only the basal diet did not show evidence that the diet was inadequate for normal nutrition excepting that the plasma ascorbic acid level decreased to a low value (0.2 mg. per hundred cubic centimeters) and the excretion of thiamine in the urine was reduced to a level indicative of borderline thiamine deficiency. A systematic study of the data secured from psychomotor, perceptual and intellective tests failed to reveal any consistent evidence that the vitamin levels of the basal diet were inadequate. Nor was there any discernible effect on the tolerance to cold as measured by changes in rectal and mean skin temperature, the latter varying with environmental temperatures, as has been recently emphasized.[2] The addition of the water soluble vitamins was likewise without effect on the tolerance to

1. Glickman, N.; Keeton, R. W.; Mitchell, H. H., and Fahnestock, M. K.: Am. J. Physiol. **146**: 538 (July) 1946.
2. Adolph, E. F., and Molnar, G. W.: Am. J. Physiol. **146**: 507 (July) 1946.

cold as well as on the psychomotor, perceptual and intellective tests.

These careful studies thus indicate clearly that the ability of man to withstand the damaging effects of repeated exposures to cold cannot be appreciably altered by giving excessive doses of ascorbic acid, thiamine, riboflavin and nicotinic acid above the amounts required for apparently normal nutrition. The possibility that the water soluble vitamins might show a favorable effect in subjects with definite avitaminosis, of course, is not answered by these experiments.

Current Comment

THE QUESTIONNAIRE ON MILITARY MEDICAL SERVICE

Pursuant to a resolution passed by the House of Delegates of the American Medical Association in December 1945, the Board of Trustees appointed a Committee on National Emergency Medical Service to undertake a critical study of the duties of medical officers during the war, with special reference to (1) opportunities for study, research and actual treatment of the sick, (2) rotation of medical assignments and (3) quasimedical duties for which technicians and specially trained enlisted personnel might replace physicians. The committee is headed by Dr. Edward L. Bortz, Philadelphia, and includes Drs. Harold S. Diehl, Minneapolis; Perrin H. Long, Baltimore; Harold C. Lueth, Omaha; O. O. Miller, Louisville, Ky.; James C. Sargent, Milwaukee, and V. C. Tisdal, Elk City, Okla., thus having in its membership men who served in the Army and Navy medical departments and civilian physicians. Several months ago the committee sent a pilot questionnaire to 1,000 former medical officers and received 470 replies, which are an indication of the great interest in this study (see Organization Section, this issue, page 719). Now the committee is distributing the questionnaire to 45,000 medical officers who have been discharged from the armed forces. The questionnaire gives opportunity for an expression by the discharged medical officer of his observations and his opinions. The Bureau of Medical Economic Research of the American Medical Association has aided in the development of the questionnaire, so that the replies can be recorded on punch cards and permit statistical data which should be of vast help to the government services concerned as well as to the physician who volunteers his services in response to the nation's call. The preparation and the circulation of this questionnaire and the counting of the replies are a difficult, costly procedure. Physicians who receive the questionnaire can cooperate best by giving careful consideration to every question and answering as promptly and completely as possible.

U. S. MILITARY MEDICINE IN WORLD WAR II

The mortality rate from wounds among the combatant forces of the United States Army in World War II was less than 3 per cent, or well under one half of that in World War I, said to be variously from 7 to 10 per cent. These truly remarkable results are usually attributed to recent scientific advances, such as the antibiotics ("miracle drugs"), blood banks, blood transfusions and blood substitutes, such as plasma or serum albumin, and the use of new narcotics and anesthetics. The credit should actually be given to factors which made these discoveries and their application possible, namely the gradual growth of medical knowledge and expertness, largely unnoticed and unheralded. What is little appreciated is that the medical progress accomplished by American medicine in the interim between the two world wars is to a great extent due to standardization of medical schools by the American Medical Association and the standardization of hospitals by the American Medical Association and the American College of Surgeons, resulting in the highest type of training for medical students and interns. Waltman Walters [1] emphasizes that there were relatively few men of preeminent ability in surgery and its specialties in the former war, whereas there were at the beginning of this war literally thousands of well trained, capable surgeons in this country, many of whom were already members of the reserve corps of the Army and Navy. Graduate medical training has also been stimulated by the creation of specialty boards. The sulfonamides and penicillin were important factors in combating infection, while blood and plasma transfusions did much to counteract shock. Of the greatest importance, however, was the organization of the medical service which made it possible to treat most wounded men within a few hours from the time their injuries were received.

CONSERVATION OF HEARING

A long range program on the conservation of hearing has been projected by a special committee of the American Academy of Ophthalmology and Otolaryngology. In addition to research on specific otologic diseases, the objectives include the testing of the hearing of school children and the establishment of state programs to encourage legislation promoting such tests. Expansion of testing programs of adults is also recommended. An important part of the program involves the promotion of education regarding the problems facing those who are hard of hearing. The establishment of hearing rehabilitation clinics in cooperation with medical schools, hospitals and already existing clinics is to be promoted. The medical profession at large can agree with the objectives defined, and its cooperation is certain.

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1. Walters, Waltman: Surgery in Naval Warfare, National Legionnaire, November 1945.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

Nov. 18, 1946.

Taft Plans to Reintroduce Bill to Provide Medical Care for the Poor

Senator Robert Taft of Ohio plans to reintroduce for consideration by the incoming Republican Congress bills he authorized to spend millions of dollars in federal funds for social welfare. The measures would give federal money to states for medical care for the poor, provide federal aid for education and finance the controversial Wagner-Ellender-Taft housing bill. The medical care bill would allot $200 million a year to the states for use in providing general medical care for the poor. To get the federal money, the states would have to set up a system by which medical care would be made available to every resident unable to pay for its cost. The federal aid for education bill would seek to insure that every school district in the United States has $40 a year to spend on the education of each child of school age. Some districts have as little as $7 a year per child, and others have as much as $150.

Crabtree Describes U. S. P. H. S. Construction Plans

Speaking for Surg. Gen. Thomas Parran, who could not attend the dedication ceremonies of the new infectious disease laboratory of the U. S. Public Health Service because of illness in his family, Dr. James A. Crabtree, deputy surgeon general, described the laboratory's great growth in ten years from small beginnings. He told of construction plans, estimated to cost between $15,000,000 and $20,000,000, for expansion of the National Cancer Institute, for actual treatment of cancer for an institute for research in mental diseases and for a national dental institute. It is planned to use at present the industrial hygiene department for joint study of radioactive isotopes in medicine and other fields with the Bureau of Standards. Dr. R. E. Dyer, director of the National Institute of Health, of which the new laboratory will be a unit, traced the sixty years of U. S. P. H. S. research. Dr. Detlev Bronk, chairman of the National Research Council, emphasized the need for government sponsored research to pioneer in new fields.

Amputee Is First Disabled Man to Be Enlisted by Army

Under a policy announced by General Eisenhower, chief of staff, an army sergeant who lost his left arm in aerial combat over Rangoon in 1944 has been the first man accepted in the program whereby 5,000 disabled veterans will be permitted to rejoin the service. The plan provides for veterans disabled in combat who meet the minimum physical standards for enlistment (with the exception of the specific disability) and who will require no more hospitalization.

Health Official Denies that Old Newspapers Carry Disease

Dr. Hobart M. Corning, superintendent of District of Columbia schools, was advised by George Ruhland, health officer, that there is no basis for the assertion of school custodial forces that handling old newspapers by children in salvage drives exposed them to contagion. Dr. Ruhland said that the common communicable diseases are rarely if ever spread by newspapers, and then only under most unusual circumstances. He said that bank tellers are not more frequently affected by diseases, although they are constantly handling paper money.

President Gives Final Approval for Nevius Tract as Veterans Hospital

Controversy over whether the Nevius tract, adjoining Arlington National Cemetery, should be used as the site of a 750 bed veterans hospital for the Washington area has ended. President Truman has signed the bill authorizing its use. Veterans administrator Omar N. Bradley and Dr. Paul R. Hawley, medical director, said that the hospital might be completed by the middle of 1948.

Coming Medical Meetings

American Medical Association House of Delegates Supplemental Session, Chicago, Dec. 9-11. Dr. George F. Lull, 535 N. Dearborn St., Chicago 10, Secretary.

Conference of State Secretaries and Editors, Chicago, Dec. 7-8. Dr. George F. Lull, 535 N. Dearborn St., Chicago 10, Secretary.

American Academy of Allergy, New York, Nov. 25-27. Dr. Karl D. Figley, 316 Michigan St., Toledo 2, Ohio, Secretary.

American Academy of Dermatology and Syphilology, Cleveland, Dec. 7-12. Dr. Earl D. Osborne, 471 Delaware Ave., Buffalo, N. Y., Secretary.

American College of Surgeons, Cleveland, Dec. 16-20. Dr. Dallas B. Phemister, 40 E. Erie St., Chicago 11, Secretary.

American Society of Anesthesiologists, New York, Dec. 12. Dr. Curtiss B. Hickcox, 745 Fifth Ave., Room 1503, New York, Secretary.

National Society for the Prevention of Blindness, New York, Nov. 25-27. Mrs. Eleanor Brown Merrill, 1790 Broadway, New York 19, Executive Director.

Post Graduate Medical Assembly of South Texas, Houston, Dec. 3-5. Dr. M. B. Stokes, 229 Medical Arts Bldg., Houston, Secretary.

Puerto Rico, Medical Association of, Santurce, Dec. 13-15. Dr. Rafael A. Vilar, P. O. Box 3866, Santurce, Secretary.

Radiological Society of North America, Chicago, Dec. 1-6. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse 2, N. Y., Secretary.

Southern Surgical Association, Hot Springs, Va., Dec. 10-12. Dr. Alfred Blalock, Johns Hopkins Hospital, Baltimore 5, Secretary.

Western Surgical Association, Memphis, Tenn., Dec. 5-7. Dr. Warren H. Cole, 1853 W. Polk St., Chicago 12, Secretary.

COMMITTEE ON NATIONAL EMERGENCY MEDICAL SERVICE

Herewith is a greatly reduced facsimile of the front side of the postwar questionnaire prepared by the Committee on National Emergency Medical Service. This questionnaire has been sent to 45,000 physicians who have been discharged from the Army and Navy medical departments. The questionnaire provides opportunity to identify the physician by his qualifications and to indicate the number of years of service and the government agency with which he served. It will indicate the portion of the world in which the service was rendered and the type of unit with which the physician was associated. The controversial question as to the amount of time actually given by the physician to the practice of his profession in the armed forces and the need for the number of physicians employed will be subjected to analysis based on the actual data. The questionnaire indicates also the kind of training received by the physician and its usefulness to him, his opinion of the nature and quality of the assignments that he received and the extent to which his professional skills were utilized. Finally, the questionnaire will indicate the extent to which he was given opportunity to keep abreast of medical advancement through various technics and his opinion as to the relative usefulness of these technics. Opportunity is given also for any physician to discuss in extenso some particular phase of his medical service if he wishes to do so.

POSTWAR QUESTIONNAIRE

Prepared by the
NATIONAL EMERGENCY MEDICAL SERVICE COMMITTEE
of the
AMERICAN MEDICAL ASSOCIATION
535 North Dearborn Street, Chicago 10, Illinois

GENERAL INFORMATION

6-9. Graduate of _____ (Exact name of medical school) 10-11. Graduation _____ (Year)

12-13. Year of birth _____ 14-17. DATES: Entered military service _____ (Month) _____ (Year) and Discharge _____ (Month) _____ (Year)

18-20. At time of entering active military service you were in:
☐ Full General Practice ☐ Practice limited Exclusively to Specialty checked (V) below ☐ General Practice with Special Attention devoted to the ONE Specialty checked (V) below ☐ Residency of type checked (V) below ☐ Internship

21-22.

☐ 1. Surgery	☐ 12. Ophthalmology	☐ 23. Pathology
☐ 2. Neurological Surgery	☐ 13. Otolaryngology	☐ 24. Clinical Pathology
☐ 3. Plastic Surgery	☐ 14. Ophthalmology—Otolaryngology	☐ 25. Bacteriology
☐ 4. Industrial Practice	☐ 15. Pediatrics	☐ 26. Public Health
☐ 5. Obstetrics	☐ 16. Neurology	☐ 27. Allergy
☐ 6. Gynecology	☐ 17. Psychiatry	☐ 28. Cardiology
☐ 7. Obstetrics and Gynecology	☐ 18. Neurology and Psychiatry	☐ 29. Gastroenterology
☐ 8. Orthopedic Surgery	☐ 19. Internal Medicine	☐ 30. Physical Medicine
☐ 9. Proctology	☐ 20. Tuberculosis	☐ 31. Thoracic Surgery
☐ 10. Urology	☐ 21. Anesthesia	☐ 32. _____ (Other)
☐ 11. Dermatology	☐ 22. Roentgenology, Radiology	

23-24. If a Specialist, do you hold a certificate from any of the following American Boards?
Yes ☐ No ☐ If Yes, indicate which Board by (V) Year received _____

☐ 1. Pediatrics	☐ 6. Urology	☐ 11. Otolaryngology
☐ 2. Psychiatry and Neurology	☐ 7. Obstetrics and Gynecology	☐ 12. Surgery
☐ 3. Orthopaedic Surgery	☐ 8. Internal Medicine	☐ 13. Anesthesiology
☐ 4. Dermatology and Syphilology	☐ 9. Pathology	☐ 14. Plastic Surgery
☐ 5. Radiology	☐ 10. Ophthalmology	☐ 15. Neurological Surgery

25. Circle years of active service in the armed forces since 1939: 1 2 3 4 5 6 7

26. Your military service was with: ☐ Army 1 ☐ Navy 2 ☐ USPHS 3 ☐ VA 4 ☐ Other (explain) 5 _____

27. Highest military rank _____

28-47. Name of region and months of service there:

	Months		Months		Months
1. N. America (Entire Continent, including Alaska and Aleutians, Canada, Central America, Panama, etc.)		5. Africa (Entire Continent)		9. South Pacific	
2. S. America (Entire Continent)		6. China, Burma, India		10. Japan (Korea)	
3. Br. Isles		7. Atlantic (West Indies, Iceland, etc.)		11. Other	
4. Europe (Including Mediterranean)		8. Central Pacific			

48. Circle months of service outside U. S. A.: None 6 12 18 24 30 36 42 48 54 or more

MILITARY SERVICE

49-78. Nature of services, areas (write-in numbers 1 to 11 for areas as listed in Question 28-47 above) and duration:
N. B.—List **ALL** services and areas in which you served, even though the same (period of) months may be recorded more than once.

	Area (Use numbers)	Months		Area (Use numbers)	Months
49-51. Hospitals			70-72. Training of others		
52-54. Dispensaries			73-75. Administration [Not (medical) Commanding Officer]		
55-57. Tactical Units			**OR**		
58-60. Troopship, L. S. T., etc.			76-80. You were (medical) Commanding Officer (e. g. Hospital, Battalion, Ship, etc.)		
61-63. Battleship or Cruiser					
64-66. Smaller Ships, Destroyer, etc.					
67-69. Shore Installations					

_____ (Specify Unit)

Front page of postwar questionnaire.

GOVERNMENT SERVICES

ARMY

VACCINATION OF MILITARY PERSONNEL AGAINST INFLUENZA

During the fall and winter of 1946 and 1947 vaccination of military personnel against influenza will be undertaken on evidence of an incipient or beginning outbreak of the disease. The policies and procedures outlined will apply:

For Installations in Continental United States:

1. On receipt of this circular (312 W. D., Washington, Oct. 19, 1946), all camps, posts and stations will submit requisitions to the St. Louis depot for influenza virus vaccine (unit -30 cc. vial) medical catalogue number 1605900. The amount requisitioned will be calculated on the basis of thirty-eight vials per thousand troops as estimated for Dec. 1, 1946.

2. Shipment of the vaccine will be deferred until there is definite indication for vaccination and will be effected by the depot when directed by the Surgeon General. Vaccination of all military personnel will be accomplished at once on receipt of the vaccine. This method of distribution is directed because of the necessity for conserving materials and for maintaining a strategic central reserve of vaccine. Plans for orderly and expeditious vaccination of all military personnel, including ready availability of necessary equipment, will be made at all stations to insure the rapid completion of the program.

3. All suspected outbreaks of influenza occurring in a military installation or command will be immediately reported to the Surgeon General by telephone or telegraph.

4. Each army area laboratory is equipped for the performance of specific diagnostic tests for influenza A and B. On the ocurrence at any army installation of cases suspected of being influenza, acute and convalescent blood serum specimens (4-5 cc.) will be aseptically collected from each of several representative patients. From each patient selected the first or acute specimen should be obtained within forty-eight hours of the onset of illness and refrigerated. The second or convalescent specimen taken seven to ten days later should be paired with the first or acute specimen and both, properly labeled, forwarded together to the appropriate army area laboratory. These specimens need be obtained from only a limited sample (10 to 20 cases) of suspected cases early in an outbreak in order to establish the presence of influenza A or B. These tests are confirmatory only, and the report of suspected outbreaks as required in 3 should not await their outcome.

For Overseas Installations:

1. Influenza vaccine is to be requisitioned from the United States in accordance with the instructions published in War Department radios of Sept. 13, 1946. A plan should be devised to insure rapid and complete distribution of this material to all military installations should the need for vaccination arise. Each installation should be instructed to have ready the equipment necessary for the immediate and complete vaccination of all military personnel on receipt of instructions to vaccinate.

2. The decision to employ vaccination against influenza will rest with the oversea commander and will be determined by evidence of an incipient or beginning influenza outbreak. Oversea commanders will notify the Surgeon General by radio immediately when the decision to vaccinate is made and will state the indications therefor.

3. All available facilities should be utilized for the early detection and reporting of suspected outbreaks of influenza. Special radio reports should be made to the Surgeon General on the occurrence of suspected or proved outbreaks.

COMMENT

Influenza vaccination will consist of a single dose of 1 cc. of the vaccine, administered subcutaneously. Precautions will be taken to avoid administering influenza vaccine to persons sensitive to eggs. To elicit a history of egg allergy, all persons to be vaccinated should be asked if they are able to eat eggs. The vaccine should be withheld from those who answer in the negative unless further investigation rules out egg sensitivity. Record of vaccine administration should be made on WD AGO form 8-117 (Immunization Register); indication of egg sensitivity, if present, should also be entered on this form.

As indicated in the circular, influenza vaccination of army personnel during the coming season will be practiced not as a precautionary measure but as a specific control procedure to be applied if definite occasion arises. The value of influenza vaccine for the prevention of influenza A was well demonstrated in the series of controlled studies at a number of universities in 1943 and 1944 and reported in the *American Journal of Hygiene* in July 1945. It is felt that the value of vaccine for the prevention of influenza B has also been demonstrated, although quantitative data similar to that collected during the earlier trials are not available. The vaccine was used for all military personnel during the fall and winter of 1945-1946, the majority of troops having been vaccinated before the outbreak of influenza B which occurred last December. By comparison with civilian and other unvaccinated groups there can be little doubt that influenza B was present in army personnel to a considerably less extent than would have been the case had vaccination not been practiced. The observations of Francis in his article in THE JOURNAL, May 25, tend to corroborate this view.

ARMY AWARDS AND COMMENDATIONS

Brigadier General Ralph H. Goldthwaite

The Legion of Merit was recently awarded to Brig. Gen. Ralph H. Goldthwaite, M. C., U. S. Army, of Washington, D. C., "for outstanding services from August 1942 to October 1945 as commanding general, Army and Navy General Hospital, Hot Springs, Ark. He supervised the expansion of this installation and brought it to peak efficiency from the standpoint of patient care and hospital staff morale." The citation states that the great success which his efforts achieved was brought about by "superior professional ability and sympathetic understanding of the problems involved in operating this highly specialized medical center." Dr. Goldthwaite graduated from Harvard Medical School, Boston, and entered the service May 26, 1909.

Major Marcus Feinstein

The Army Commendation Ribbon was recently awarded to Major Marcus Feinstein, M. C., A. U. S., New York, whose skilful professional service rendered in connection with the care of patients and in the study of an outbreak of unusual acute respiratory disease in a bomber squadron returned from overseas contributed both to the welfare of the troops and to the early collection of essential medical data. The commendation stated that this combination of clinical and epidemiologic investigation constituted a valuable addition to knowledge. Dr. Feinstein graduated from New York Medical College, Flower and Fifth Avenue Hospitals and entered the service Nov. 14, 1942.

Colonel Earle Standlee

The Oak Leaf Cluster to the Legion of Merit was recently awarded to Col. Earle Standlee, M. C., U. S. Army, of Washington, D. C. The citation stated that "while serving as deputy surgeon, Mediterranean Theater of Operations, from June 1943 to July 1945, and chief surgeon, Mediterranean Theater of Operations, from July to October 1945, he displayed a fine sense of balance necessary between administrative and professional functions of the medical service and thoroughly and ably performed the coordination and implementation of medical policy throughout long and arduous campaigns." Dr. Standlee graduated from Baylor University College of Medicine, Galveston, Texas, and entered the service July 1, 1926.

Captain Howard J. Hartman

The Bronze Star was recently awarded to Capt. Howard J. Hartman of Waterloo, Iowa, the citation reading, in part, "for meritorious service in connection with military operations against the enemy at Toem, Dutch New Guinea, from Sept. 1 to Dec. 3, 1944. . . . While serving as ward officer in a clearing station for a task force he displayed a high standard of professional and military ability . . . his untiring efforts were an inspiration to the rest of the men in the hospital." Dr. Hartman graduated from Rush Medical School and entered the service Oct. 2, 1942.

Major Patrick M. Cmeyla

The Bronze Star Medal was recently awarded to Major Patrick M. Cmeyla, M. C., U. S. Army, of Sioux City, Iowa. The citation stated that "during eleven months' captivity in the Sendai Prisoner of War Camp No. 2, Taira, Japan, he did all within his power to alleviate the suffering of his fellow prisoners, and his performance under the most adverse conditions did much to maintain high morale among a large group of allied personnel." Dr. Cmeyla graduated from the University of Louisville School of Medicine and entered the service April 15, 1941.

Lieutenant Colonel Harold A. Abramson

The Legion of Merit was recently awarded to Lieut. Col. Harold A. Abramson, M. C., A. U. S., Cold Spring Harbor, L. I., N. Y., who as chief, physical chemical section, and assistant chief, defense material branch, Edgewood Arsenal, Maryland, from July 1942 to December 1943, carried out important research in the field of chemicals. "Displaying profound knowledge, a keen, creative mind and outstanding ability," says the citation, "he made vital contributions to the Chemical Warfare Service and thus to the war effort." Dr. Abramson graduated from Columbia University College of Physicians and Surgeons, New York, and entered the service July 11, 1942.

Captain John M. Bretz

The Bronze Star was recently awarded to Capt. John M. Bretz, M. C., A. U. S., of Huntingburg, Ind. The citation reads "For the superior service you have rendered as division medical inspector. Your inspections of the many and diverse installations under division control have been consistently excellent and have provided the staff sections concerned with information and advice essential to the completion of their various missions. The high standard of sanitation now found in all our units is in itself a tribute to your conscientious and capable work." Dr. Bretz was also awarded the Purple Heart. He is a graduate of the Indiana University School of Medicine and entered the service July 1, 1942.

Captain David M. Clough

The Bronze Star was recently awarded to Capt. David M. Clough, M. C., U. S. Army, of Los Angeles, for meritorious achievement in the performance of services during the period April 15 to October 1, 1944. "When assuming complete responsibility for the malarial control program in San Severo, Italy, area," said the citation, "he performed his task far beyond the requirement of ordinary duty, overcoming almost insurmountable difficulties relative to supply, personnel and motor transportation. Captain Clough's outstanding supervision and direction of the Italian laborers was a difficult task, being handicapped in not speaking the native language. His tenacity of purpose resulted in the eradication of all serious mosquito breeding reservoirs dangerous in this area. As a result only 1 case of malaria developed in this area during the past season. Captain Clough's initiative and organizational ability were definite contributions in protecting the health of a countless number of troops from contracting malaria. His manner of execution of his duties reflect great credit on himself and the armed forces of the United States." Dr. Clough graduated from the University of Minnesota School of Medicine in 1942 and entered the service Aug. 9, 1943.

MISCELLANEOUS

THE IMPROVED VOCATIONAL REHABILITATION PROGRAM

The director of the Office of Vocational Rehabilitation, Michael J. Shortley, Washington, D. C., has announced that the states and the federal government have set a goal of 150,000 for civilians to be rehabilitated into employment each year, almost four times the number prepared and placed in suitable occupations in any one year to date. Budgetary estimates of the states indicate that there is a minimum of 1,168,000 physically or mentally handicapped persons of working age—not including veterans with service connected disabilities—in need of vocational rehabilitation services. Every state in the Union operates a civilian vocational rehabilitation program with the assistance of the federal government, Shortley said. The state appropriations, now more than 5 million dollars a year, were increased 60 per cent the only time the state legislatures met since the Rehabilitation Act was liberalized in 1943.

The District of Columbia, Hawaii and Puerto Rico, in addition to the forty-eight states, operate vocational rehabilitation programs, and Alaska will inaugurate one soon. Separately administered programs exist for the blind in thirty-six states, and in the other states and territories the blind are provided services by the regular rehabilitation agencies. The state rehabilitation agencies prepare disabled individuals for the type of employment for which their ability and talents give them opportunity for successful employment. Shortley said "Some clients go to college, others attend business and trade schools, still others develop their skills in training on the job. All clients are medically diagnosed and, where necessary, are provided with physical restoration to remove or reduce the effects of the disability. Training is provided as needed. In each instance counseling and guidance continue until satisfactory performance on the job justifies closing the case."

The average number of rehabilitations into employment has risen from 9,100 a year before passage of Public Law 113 to more than 40,000 a year after passage, an increase of better than 400 per cent.

The amendments of 1943 to the original vocational rehabilitation act made possible the improvements in service. These amendments provided full medical, surgical and psychiatric services to remove or reduce the disability, whereas before 1943 the rehabilitation agencies had been forced to train around the disability, without attempting to alleviate it. The amendments also extended stronger federal financial support to the state agencies and thus stimulated many of them to greater activity.

The improved vocational rehabilitation program, Shortley said, is eliminating a great amount of dependence. It costs $300 to $600 a year to maintain a disabled person. It costs, on an average, $300 to rehabilitate him. Second, the program is increasing the productive manpower of the nation. About 75 per cent of the 1946 rehabilitants were unemployed at the time the states started services. About 16 per cent of the rehabilitants had never worked before.

INSTITUTE OF INTER-AMERICAN AFFAIRS

The Training Division of the Institute of Inter-American Affairs, under the direction of Dr. William W. Peter, reports that 99 public health trainees were in the United States as of October first of this year to carry on studies during the academic year 1946-1947, including 88 men and women here on regular study grants: 20 engineers, 38 doctors (2 women), 25 graduate and undergraduate nurses, 1 statistician, 1 laboratory technician, 1 hospital records clerk, 1 laundry manager and 1 dietitian. These public health trainees represent thirteen South and Central American republics: Brazil 44, Bolivia 11, Chile 6, Columbia 9, El Salvador 4, Nicaragua 4, Guatemala 6, Peru 5, Costa Rica 3, Ecuador 1, Mexico 2, the Dominican Republic 2 and Venezuela 2.

As of October 1, 559 Public Health Fellows from eighteen countries had come to the United States under the Institute of Inter-American Affairs Health and Sanitation training program since its inception, July 1, 1944.

PHYSICIANS SEPARATED FROM SERVICE

ARMY MEDICAL CORPS OFFICERS RECOMMENDED FOR/OR RELIEVED FROM ACTIVE DUTY

Alabama

Clark, Charles E.....Wetumpka
Clay, Richard C.....Birmingham
Dawson, Lewis M.....S. Birmingham
Delorme, Thomas L. Jr.....Birmingham
McClain, George C.....Mobile
Meissner, Tom O. W.....Birmingham
Prescott, John L.....Birmingham
Reynolds, Walter Jr.....Anniston

Arizona

Deatsch, Joseph H.....Peoria
Moon, Orville B. Jr.....Bisbee

Arkansas

Hearin, James T.....Arkadelphia
Kennedy, Jack W.....Prescott
Moore, Edwin G.....N. Little Rock
Pride, B. H.....Ft. Smith
Rector, Joe L. Jr.....Searcy
Riddler, John G.....Ft. Smith
Ross, James S.....Okolona
Strauss, Alvin W. Jr.....Little Rock
Webb, James W.....Hector

California

Albi, Piero.....San Francisco
Alcorn, Chester L.....Los Angeles
Alderfer, Arthur J.....Upland
Barry, John W.....Long Beach
Buss, Paul G.....Santa Ana
Cardon, Rey L.....Los Angeles
Charvet, Leonard W.....San Francisco
Cramer, Quentin.....Orange
Crockett, Joseph T.....Hayward
Davlin, Lavelle P.....Gonzales
Denlinger, Ross B.....Long Beach
Forgey, Burnell G.....Arcadia
Foster, Charles G.....San Fernando
Goddard, Paul C.....San Jose
Goodhart, Gordon E.....S. Pasadena
Googooian, Charles.....Fresno
Hastings, Thomas N.....Los Angeles
Hause, Donald P.....San Francisco
Herren, Reginald R.....Los Angeles
Iverson, Preston C.....Beverly Hills
Jacobs, Byron P.....Pomona
Katz, Hilliard J.....San Francisco
Keese, Anthony V.....Pasadena
Kirtland, H. B. Jr.....San Luis Obispo
Kruse, Charles A.....Los Angeles
Langmade, Charles F.....Corona del Mar
Leary, John H.....Downey
McCoy, Carroll A.....Los Angeles
Margen, Sheldon.....San Francisco
Martin, Josef R.....Santa Monica
Miller, Leo.....Los Angeles
Miller, Ralph N.....Porterville
Miller, Wilbur D.....San Francisco
Monlux, Robert D.....San Francisco
Nickel, Vernon L.....Riverside
Pratt, Donald R.....San Francisco
Prestwood, August R.....San Francisco
Rife, Robert J.....Fresno
Robson, Philip G.....Campbell
Roos, John C.....Los Angeles
Stemmle, Kenneth E.....Crockett
Tilly, John T.....Orange
Wainman, Philip.....Los Angeles
Wayson, Edward E.....San Francisco
Weiss, Maurice R.....Hollywood

Colorado

Absher, William K.....Denver
Dubin, Frank I.....Denver
Harris, Jack T.....Lamar
Jackson, Taylor W.....Denver
Laneback, Franklin B.....Rocky Ford
Levine, Samuel.....Denver
Richard, Warren E.....Denver
Tannenbaum, Philip D.....Denver
Wenzel, Paul A.....Brighton

Connecticut

Brinkley, Sterling B.....New Haven
Jaiven, Saul J.....Stamford
Kogut, Henry V.....Bridgeport
Lieberthal, Milton M.....Bridgeport
Lubchansky, Jacob H.....Uncasville
Mark, Lester C.....Ansonia
Mitchell, Gerald V.....Milford
Narowski, John J.....Derby
Palazzo, Frank A.....Bridgeport
Pantaleo, Carl V.....New Haven
Rausch, Norman W.....W. Hartford
Soule, Robert M.....Norwalk
Veneruso, Leonard C.....Bridgeport
Waltman, Irvin G.....Hartford

District of Columbia

Holloman, John L. S.....Washington
Hoyt, Charles G.....Washington
Kartus, Irving.....Washington
Marble, George H.....Washington
Weitzen, Edwin H.....Washington

Florida

Kendrick, James E.....Tallahassee
Lindeman, Frank H. Jr.....Leesburg
Miller, Clay R.....Pensacola
Robbins, Ralph.....Miami Beach
Wilson, George F.....Coral Gables

Georgia

Kitchens, William C.....Augusta
Kleinman, Roy B.....Atlanta
Powell, William F.....Macon
Watters, Julian Q.....Atlanta

Idaho

Hatch, Joseph M.....Idaho Falls
McQueen, Kent.....Preston

Illinois

Borgerson, Robert J.....Elmhurst
Curoso, Louis C.....Chicago
Daughaday, William H.....Winnetka
Grove, William J.....Ottawa
Gumbiner, Bernard.....Chicago
Hamilton, James W.....Chicago
Hammond, Donald R.....Chicago
Hayes, Edward L.....Humboldt
Highsmith, LaRue S.....Flat Rock
Hyman, Maurice M.....Joliet
Jemsek, John.....Argo
Journay, John L.....Chicago
Kerwin, Marshall D.....Chicago
Klein, Ernest S.....Chicago
Klingel, Robert L.....Belleville
Kraus, Albert P.....Chicago
Lane, John T.....Maywood
Larson, Alvin R.....Evanston
Liebross, Joseph.....Chicago
Marcus, Irwin M.....Chicago
Mazur, Lawrence.....Chicago
Minkler, Frederick C. Jr.....Evanston
Modert, Jean M.....Mt. Vernon
Moyer, John B.....La Grange
Novota, Otto J.....Chicago
Nusbaum, David.....Chicago
O'Malley, Joseph W.....Ohio
Palumbo, Joseph L.....Elmwood Park
Phillips, William H.....Chicago
Pilot, Jean.....Chicago
Rice, Harry E.....Waukegan
Sacks, Harold J.....Chicago
Siegel, Alfred L.....Chicago
Stern, Sidney G.....Chicago
Ungerleider, Jerome L.....Chicago
Volk, Bruno W.....Chicago
Waitkus, John P.....Chicago
Wandke, Otto E.....Chicago
Watenmaker, William M.....Chicago
Wolff, Hilburt L.....Chicago
Woody, Howard G.....Park Ridge

Indiana

Himebaugh, James R. S.....Greenwood
Huff, Stanley E.....Bremen
Kelly, William M.....Goshen
Kobrak, Heinrich G.....Gary
Logan, Richard S.....Urbana
Marlowe, John J.....East Chicago
Middleton, Thomas O.....Ridgeville
Morris, Robert A.....Rochester
Ornelas, Joseph P.....Gary
Painter, Donald S.....Garrett
Peacock, Robert C.....Dunkirk
Records, Carl J.....Indianapolis
Schafer, William C.....Decatur
Staunton, Henry A.....Fort Wayne
Sterne, John H.....Indianapolis
Tempey, Fred W.....Indianapolis

Iowa

Greenleaf, John S.....Centerville
Ivens, Milton H.....Waukon
Jacques, Lewis H.....Galva
Koester, John F.....Davenport
Kovar, Jerome D.....Sioux City
Krettek, John E.....Council Bluffs
Kriechbaum, James B.....Burlington
Kuhl, Augustus B. Jr.....Davenport
Lagen, Mansfield S.....Dubuque
Losh, Clifford W. Jr.....Des Moines
Maplethorpe, Charles W. Jr.....Toledo
Montgomery, Paul W.....Iowa City
Plager, Vernon H.....Grundy Center
Smrha, James A.....Cedar Rapids
Stewart, John K.....Clinton
Updegraff, Robert R.....Boone

Kansas

Bosilevac, Fred N.....Kansas City
Burnett, Jack M.....Pittsburg
Changus, George W.....Kansas City
Clark, Laurence A.....Rush Center
Hoberman, Morton.....Leavenworth
Johnson, Charles H.....Kinsley
Lehner, Richard L.....Kansas City
Lichlyter, Moyne W.....El Dorado
Matson, James A.....Goodland
Menninger, William C.....Topeka
Nice, Charles M. Jr.....Parsons
Nohe, Philip C.....Kansas City
Plowman, Warren A.....Jewell
Roller, Merrill J.....Altamont
Von Leonard, George Jr.....Hutchinson
Walker, Maurice A.....Kansas City
Wilson, Donald J.....Tribune

Louisiana

Balovich, Vernon N.....New Orleans
Day, Samuel M. Jr.....Alexander City
Lipman, Werner L.....Morse
Mauterer, Oliver P.....Olla
Morris, Harry D.....New Orleans
Morrison, Harry K.....Sherburne
Slaughter, Howel W.....New Orleans
Wafer, John G. Jr.....Shreveport
Webb, Herbert M.....Lafayette

Maryland

Horvath, Peter N.....Bethesda
Kehne, John H.....Frederick
Langeluttig, Harry V.....Baltimore
McMillin, David R.....Riverdale
Mech, Karl F.....Baltimore
Miller, John E.....Sellman
Musnick, Henry.....Baltimore
Phillips, Otto C.....Baltimore
Porter, Harry P. Jr.....Baltimore
Pumphrey, Albert F.....Millersville
Rhetta, Barnett M. Jr.....Baltimore
Sones, Frank M. Jr.....Baltimore
Stoner, James E. Jr.....Woodsboro
Young, Latimer G.....Baltimore

PHYSICIANS SEPARATED FROM SERVICE

Massachusetts

Cavanaugh, T. E. Jr.....W. Springfield
Cohen, Joseph P.....Newton Center
Fletcher, Kenneth S. Jr.....Chicopee
Grandfield, Robert E.....Roslindale
Guenther, Richard A.....Clinton
Hervey, Zoltan.....Boston
Hooper, Francis W.....Quincy
Jackson, James H.....Boston
Karlsberg, Isador J.....Hudson
Kennedy, John E.....Adams
Lamphier, Timothy A.....Wellesly Hills
Lane, Alfred L.....Boston
Latham, Raymond W.....Boston
La Vigne, Richard J.....Worcester
Laxson, Gerald O.....Lexington
Leard, Samuel E.....West Roxbury
Leclercq, George T.....Boston
Ledgard, James J. Jr.....Maynard
Little, Amos R. Jr.....Marlboro
McGillicuddy, John J.....Boston
Mansfield, James S.....Boston
Mason, Mahlon R.....Marblehead
Matz, Myron H.....Dorchester
Mindus, Walter V.....New Bedford
Minkel, Herbert P.....Brighton
Morrison, John L.....Boston
Myerson, Ralph M.....Somerville
Paparo, Gary P.....Brockton
Samson, Daniel P.....Brockton
Spunt, Edward T.....Holyoke
Sullivan, Arthur P.....S. Braintree

Michigan

Armstrong, Theodore M.....Bronson
Caldwell, James L.....Ann Arbor
Jauquet, Joseph M.....Sagola
Jayson, Michael H.....Detroit
Kennedy, Donald J.....Detroit
Kiehn, Clifford LaV.....Ann Arbor
Kilmer, David N.....Reed City
Knoke, F. W. Jr.....Grosse Pointe Park
Koontz, Emery R.....Grand Rapids
Lange, William A.....Detroit
Lannik, William M.....Jackson
Levitt, Irving.....Detroit
Lichtwardt, Harry E.....Highland Park
Longo, Salvatore.....Eben Junction
Meeuwsen, Bernard.....Grand Rapids
Meinke, Albert H. Jr.....Detroit
Moorstein, Benjamin.....Traverse City
Padrous, Argy N.....Detroit
Reisman, David D.....Detroit
Stobbelaar, Robert H.....Grand Rapids
Turner, Merald G.....Davisburg
Vandenberg, Henry J. Jr. E. Grand Rapids
Verwys, Adrian L. H. Jr...Grand Rapids
Vining, Keats K. Jr.....Grand Rapids
Wadsworth, George H.....Detroit
Weiss, Arno W.....Port Hope

Minnesota

Balfour, Donald C. Jr.....Rochester
Hall, Wilson B.....Minneapolis
Johnson, Kenneth J.....St. Paul
Katz, Louis J.....St. Paul
King, Lyndon M. Jr.....Minneapolis
Lueck, Wallace W.....Benson
McCormick, Donald P.....S. Minneapolis
Rowe, Clarence J.....St. Paul
Tarail, Robert.....Minneapolis
Van Ryzin, Donald J.....Duluth

Missouri

Applewhite, Calvin W.....Kansas City
Byland, Benjamin F.....Burlington Jct.
Harding, Herbert C.....Kansas City
Klauman, Benjamin F.....Kansas City
Knabb, Harris E.....Springfield
Knapp, Rudolf.....Golden City
Kneznekoff, Leonard.....St. Louis
Kraft, Edward O. Jr.....University City
Large, Alfred McK.....St. Louis
Lionberger, John R. Jr.....St. Louis

Missouri—Continued

McMullen, Thomas.....Tarkio
Matteson, Frank B.....Parnell
Mayer, John H. Jr.....Kansas City
Meyn, Werner P.....St. Louis
Michaelree, John F.....St. Louis
Siebert, Theodore R.....St. Louis
Starkloff, Gene B.....St. Louis
Stewart, John H.....Gallatin
Towers, Orville W.....St. Charles
Welsh, Laurence C.....St. Louis

Nebraska

Ewing, John D.....Omaha
Lake, Max S.....Lincoln
McCullough, Charles S.....Omaha
Moessner, Samuel F.....Lincoln
Sindelar, Joseph B.....Chappell
Squires, Robert S.....Lincoln
Stone, Frank P.....Omaha

New Hampshire

Foster, E.....Concord
Johnson, John M. Jr.....Manchester
Laflamme, Leo A.....Manchester
Lampesis, Peter T.....Dover
McIntire, Percy C.....Marlboro
Pratt, Howard E.....Keene

New Jersey

Condit, Norman I.....Maplewood
Hermann, John H. Jr.....Orange
Hoffman, Abraham C.....Hammonton
Iraggi, James V.....Passaic
Jaffe, Benjamin.....Jersey City
Judd, Joseph Jr.....Elizabeth
Kallen, Arnold M.....Newark
Keller, Michael L.....Paterson
Kerekes, Ernest S.....Passaic
Kollmar, George H.....Short Hills
Kollmar, Robert.....Short Hills
Koralek, Adolph H.....Newark
Leibundguth, Henry.....Clifton
Lloyd, Samuel J.....Trenton
Loomis, Arthur H.....Westfield
McKay, Robert J. Jr.....Basking Ridge
Marder, Maxwell J.....Bayonne
Miller, Herman P.....Newark
Mintzer, Donald W.....Ocean City
Moneagle, Julius E.....Madison
Moore, Harold.....Paterson
Mosig, John J.....Paterson
Paisley, Ellwood S.....Pitman
Plancey, Melvin R.....Bloomingdale
Sollami, William R.....Trenton
Steinberg, Werner.....Linden
Toto, Anthony N.....Newark
Varhol, Joseph G.....Passaic
Weiner, Herman R.....Camden

New York

Atkinson, John Jr.....Kenmore
Auletta, Alfred R.....Long Island City
Ayo, Corrado.....New York
Bell, George R.....New York
Bell, Joseph L.....Brooklyn
Bikle, Charles E. Jr.....Genoa
Bonventre, Martin V.....Brooklyn
Bruno, Stephen F.....Long Island City
Bruschi, Marco.....Brooklyn
Bukanz, Seymour L.....New York
Cattano, Edward L.....New York
Chamberlain, George E.....New York
Clark, Charles M. Jr.....Long Island
Clifford, Joseph C.....Gloversville
Cocuzzi, Frank A.....Rochester
Delisa, Dominick A.....Schenectady
Ehrenreich, Theodore.....New York
Ehrlich, Samuel J.....New York
Fazio, Anthony N.....Brooklyn
Ficker, Robert F.....Brooklyn
Fonda, Gerald E.....New York
Fontanetta, Michael J.....Brooklyn
Goldstein, Avram S.....New York

New York—Continued

Greenberg, Abraham.....Bronx
Griggs, Stewart L.....Oneonta
Guest, Thomas P.....Rochester
Hall, Donald W.....Buffalo
Harvey, Salmon C.....New York
Hauben, Richard S.....New York
Irwin, John W.....Endicott
Jaret, Nathan M.....Middle Village
Jauernig, Russell R.....Livingston Manor
Jennings, Frank D.....Brooklyn
Kaufman, Max...Jackson Heights, L. I.
Kavetsky, Philip.....Brooklyn
Kazan, Avraam T.....New Rochelle
Kearney, Paul I.....Brooklyn
Kearns, Richard D.....Fonda
Kelly, John F.....Brooklyn
Kolisch, Paul DeR.....Brooklyn
Kopell, Harvey P.....New York
Kory, Ross C.....New York
Kraft, Norman A.....Brooklyn
Lassen, Werner J.....New York
Lehv, Gilbert G.....New York
Lerner, Samuel H.....New York
Lester, David H. R.....Schenectady
Leuzzi, Anthony P.....Yonkers
Levin, Murray N.....New York
Loomis, Frederick J.....Pulaski
Loomis, Robert O.....Rochester
Luttinger, Daniel.....Bronx
McDonald, James E.....Albany
McFadden, Cornell I.....Newburgh
Marmar, William.....Bronx
Marmon, Martin G.....Brooklyn
Marquardt, Robert G.....Binghampton
Marsh, Richard S.....New York
Matchar, Joseph C.....Brooklyn
Matura, Gerald C.....Schenectady
Meaney, Richard V.....Roslyn Heights
Meister, Alton.....New York
Milgram, Joseph E.....Brooklyn
Minowitz, Samuel.....Brooklyn
Monto, Saul B.....Whitestone
Murray, Horton L.....Syracuse
Napoleon, Louis N.....Brooklyn
Nichtern, Sol.....New York
Pierri, Charles D.....Woodside
Place, Charles H.....New Rochelle
Popper, Robert.....New York
Price, Carlton N.....Rochester
Pullman, Theodore N.....Brooklyn
Quander, Milton F.....New York
Quinlan, Edward A.....Port Chester
Rakow, Leonard S.....New York
Rayman, Norman N.....Mt. Vernon
Reilly, Philip C.....Bronx
Renda, Peter L.....Brooklyn
Reynolds, Ralph W.....Albany
Rosanelli, Edward G.....Brooklyn
Rosenstein, Joseph.....Brooklyn
Schwartz, Milton J.....Brooklyn
Senikowich, Michael A.....New York
Shaftel, Herbert E.....Brooklyn
Shelly, William P.....Poughkeepsie
Sian, Jack.....Bronx
Siegel, Bernard B.....Far Rockaway
Simmons, Richard J.....Amsterdam
Simon, Alfred J.....Buffalo
Stone, Daniel J.....Brooklyn
Strauss, James F.....New York
Stroh, Lester.....Brooklyn
Stymacin, Samuel.....Forest Hills
Taus, Harold H.....New York
Teracino, Nicholas F.....Whitestone
Tripp, Henry S.....Watertown
Trovato, Louis A.....Jamestown
Vince, Tibor A.....Laurelton
Wagner, Rudolph T.....New York
Weisberg, Harry F.....New York
Weitzner, Imre J.....New York
White, Ward J.....Massena
Wolfgruber, Paul J.....Ebenezer
Wood, Ivan R.....Mt. Morris
Wright, Arthur F.....Garden City

PHYSICIANS SEPARATED FROM SERVICE

North Carolina

Anderson, William M.....Cramerton
Bennett, Edmund D.....Asheville
Floyd, Hal S.....Fairmont
Gardner, L. I.....Reidsville
Goode, Thomas V. Jr.....Statesville
Kahn, Joseph W.....Hayesville
Kernodle, Charles E. Jr.....Elon College
Kernodle, John R.....Durham
Ledesma-Dlaz, Frank R.....Durham
Matthews, George P.....Rose Hill
Parham, Asa R.....Henderson
Sitterson, Beecher W.....Kenansville
Sparrow, Harry W.....Greensboro
Weir, Irvin M.....Bolton

North Dakota

Mahoney, James H.....Tolna

Ohio

Beach, Douglas W.....Springfield
Hays, James C.....Camden
Henry, Jack R.....Columbus
Hensler, Benton M.....Cincinnati
Huckins, Rodger S.....Cincinnati
Jackman, Allen W.....Toledo
Jackson, Alfred E.....Akron
Jacobs, William R.....Cincinnati
Kahn, Raymond M.....Dayton
Karson, Andrew J.....Valley City
Kistner, Robert W.....Cincinnati
Kohrman, Robert M...Cleveland Heights
Kupec, Joseph B.....Youngstown
Landes, John S.....New London
Linn, Robert F.....Lakewood
Love, Duane D.....Sandusky
Ludwig, Edward W.....St. Clairsville
Mansfield, George H. Jr..Cuyahoga Falls
Mathias, Charles W.....Niles
Moran, Joseph P. Jr.....Toledo
Morrison, William H.....Dayton
Oyer, Robert S.....Bluffton
Pavlatos, Nicholas B.....Springfield
Pollex, James H.....Toledo
Priest, Robert J.....Columbus
Radley, Thomas J.....Cincinnati
Rath, Charles E. Jr.....Wooster
Rehn, Richard J.....Cincinnati
Rich, Joseph R.....E. Liverpool
Rogowski, Henry F.....Portsmouth
Rosenberg, Lee S.....Cincinnati
Shreve, Alfred J.....Alliance
Shumaker, Chauncey.....Pomeroy
Spector, Horatio A.....Ironton
Stull, Joseph B.....Berea
Sundberg, Carol L.....Springfield
Wallace, Ervin B.....Columbus
Waters, William I.....W. Lafayette

Oklahoma

Gerard, Rene G.....Chickasha
Harris, Clyde E.....Oklahoma City
Ishmael, William K.....Oklahoma City
Kennedy, James R.....Purcell
McLaughlin, James R. Jr.Oklahoma City
Mackey, Abner.....Oklahoma City
Roys, Harvey C. Jr.....Norman
Thorp, Edward M.....Oklahoma City

Oregon

Long, George B.....Portland
McGowan, George J.....Portland
Miller, Owen G.....Eugene

Pennsylvania

Caren, Raymond.....Darby
Griffith, John P. Jr.....Pittsburgh
Hill, Robert J.....Cresson
Hoke, Bradley H. Jr.....Salisbury
Kaminsky, Anthony F.....Erie
Karlik, Paul Jr.....Hazleton
Kaufman, Irwin L.....Pittsburgh
Keim, Edward L.....Davidsville
Kelchner, Clyde H.....Allentown
Keller, Lynwood V.....Reading

Pennsylvania—Continued

Kolinsky, Nathan S.....Philadelphia
Kowalyk, Edward A.....Scranton
Kramer, Morris.....Easton
Lambert, Kenneth P.....Kutztown
Laudenslager, Elmer C.....Dublin
Layton, Robert R. Jr.....Philadelphia
Lehman, Clarence Long.....Palmyra
Levy, Edwin J.....Philadelphia
Lorber, Stanley H.....Philadelphia
McCloskey, Joseph F.....Scranton
McGinty, John F. Jr.....Pittsburgh
McKee, Wayne O.....East McKeesport
Magalotti, Marion F.....Masontown
Marconis, Joseph T.....Philadelphia
Matthews, George R. Jr.....York
Miller, Samuel T.....Philadelphia
Miller, Stanley.....Philadelphia
Milson, Thomas J.....Scranton
Mori, Primo P.....Vestaburg
Mulligan, Thomas M.....Keiser
Nolan, John J.....Aliquippa
Paul, James M.....York
Policarpo, Nicholas A.....Philadelphia
Quiney, James J. Jr.....Easton
Rendin, Larry J.....Boston
Robinson, Roy B.....Pittsburgh
Salis, Herbert.....Philadelphia
Sherman, Maurice J.....Philadelphia
Smale, William H.....Pittsburgh
Spina, Carmen M.....Lyndora
Sponnoble, John D.....Johnstown
Suffoletta, Daniel B.....Midland
Taylor, Lawrence.....Haverford
Tice, George A. H.....Philadelphia
Tomsula, Joseph P.....Homestead
Trimmer, John H. Jr.....York
Tyson, Edward B.....Southampton
Uhler, Walter M.....Bethlehem
Wilson, George W.....Wilkinsburg
Wilson, Loyal K.....New Brighton

Rhode Island

Jaworski, Rudolf A.....Central Falls
McClellan, George B.....Pawtucket
Millard, Charles E.....Barrington

South Carolina

McAlhany, Howard J.....Branchville
Masters, Elias W.....Columbia
Moore, Pierce J. Jr.....Spartanburg
Nesmith, Louie E.....Lake City
Page, George D.....Greenwood
Singletary, Herman L.....Lake City

South Dakota

Hofer, Amos A.....Howard

Tennessee

Bourland, Robert L.....Memphis
Butler, Richard H.....Knoxville
Jones, Henry S. Jr.....Memphis
Kelty, Karl C.....Tiptonville
Ladd, Hu E.....Kingston
Lovingood, Charles G.....Maryville
Luton, Norman S.....Dover
McGuffin, William L.....Greenville
Miles, Robert M.....Murfreesboro
Moore, William C.....Rutherford
Muncy, Estle P.....Harrogate
Murfree, Matthias B. Jr...Murfreesboro
Peebles, William R.....Paris
Polk, James W.....Troy
Reames, George E.....Memphis

Texas

Etter, Richard L.....Houston
Harmon, Franklin C. Jr.....Floydada
Jackson, Dudley Jr.....San Antonio
Jackson, Harvey K.....Dallas
Jaynes, Stanley H.....Galveston
Jenkins, Edward E.....Sugar Land
Jensen, Andrew M.....San Antonio
Kirkpatrick, Roy H.....Taylor
Kochman, Walter P.....Waco

Texas—Continued

Koerner, Theodore A.....Gatesville
McKay, James V.....Humble
Mahaffey, Cecil H.....Fort Worth
Manhoff, Charles M.....Galveston
Manhoff, Louis J. Jr.....Galveston
Myers, Theodore B.....Brady
Nixon, Robert R.....San Antonio
Northington, Harold M.....Egypt
Phillips, Richard J.....El Paso
Pridgen, James E.....Cuero
Rape, Marvin G.....Ozona
Sherrill, William M.....Houston
Shindler, Thomas O.....Hempstead
Skarke, Edward A.....Freeport
Smith, John R.....Wolfe City
Snyder, Hal.....Ft. Worth
Thompson, Cone J. Jr.....Tyler
Thompson, James T.....Port Arthur
Tyler, Joe E.....Ringgold
Vanzant, Thomas J.....Houston

Utah

Keyting, Walter S.....Salt Lake City

Vermont

Lovell, Edgar S.....Brattleboro
Pratt, William A.....Rutland

Virginia

Bell, Thomas G.....Staunton
Johnson Hal S.....Richmond
Jones, Charles F. Jr.....Lynchburg
Martin, Archibald G. M. III.....Suffolk
Merrick, John B.....Arlington
Powell, Rupert W.....Roanoke
Psimas, George N.....Charlottesville
Stamps, Edward R.....Norfolk
Thweatt, James A.....Petersburg

Washington

Morrison, Jack R.....Seattle
Proff, Harold P.....Olympia
Ramquist, Reuel T.....Kirkland
Sheehy, John J.....Seattle

West Virginia

Harvey, Harold E.....Beckley
Marvin, Samuel L.....Weirton
Miles, Howard C.....Huntington
Snyder, Thomas M.....Roanoke
Veach, Lysle, T.....Maysville

Wisconsin

Bush, Frederick I.....Fond du Lac
Gecht, Eli A.....Milwaukee
Glienke, Carl F.....Milwaukee
Hickey, Aloys W.....La Crosse
Jewell, James H.....Racine
Klaas, Frederick B.....Tony
Maylahn, Donald J.....Milwaukee
O'Donnell, Mae J.....Madison
Sharpe, Harvey R. Jr.....Fond Du Lac
Spankus, Willerd H.....Shorewood
Waldkirch, Bernard P.....Milwaukee
Weinstein, Alvin A.....Milwaukee
Young, William P.....Union Grove

Hawaii

Lau, Edward K. S.....Honolulu

Puerto Rico

Garcia, A. R.....Guayama
Marchand, Ernesto J.....Barceloneta
Menendez-Corrada, Rodrigo G..Morovis
Pelegrina-Sariego, Ivan A.....Utado
Torres, Jose M.....Santurce
Valles, Hector M.....Santurce

Canada

Koseruba, George M.....Saskatoon

Central America

Martinez, Jose F...Republic of Honduras

MEDICAL OFFICERS RELEASED BY THE NAVY

NAVAL RESERVE MEDICAL OFFICERS RECOMMENDED FOR RELEASE FROM ACTIVE DUTY

Arkansas

Barnhill, Bruce B.....Corning
Berchelmann, David A.....Camden
Bradburn, Curry B. Jr.....Little Rock
Cole, J. P.....Alma
Henry, John F. Jr.....Pottsville
Kramer, Ralph G.....Fort Smith
Lenon, E. E. Jr.....Little Rock
Lovell, Ernest M. Jr.....Little Rock
Parsons, Vollie E. Jr.....Conway
Reed, Enoch F. Jr.....Pine Bluff
Robinson, Donald E.....Little Rock
Rosenzweig, Joseph L.....Lake Village
Stanton, William B.....Fort Smith
Watkins, John G. Jr.....Little Rock

Connecticut

Correll, James W.....Fairfield
Crandall, Bradford B.....Mansfield
Cunningham, David H.....Hartford
D'Elia, Pierino F.....New London
Downing, Daniel F.....New Britain
Joslin, Stuart L.....New Haven
Keating, John J.....New Milford
Kemler, Raphael L.....W. Hartford
LaPenta, Roco G.....Hartford
Manganiello, Louis O. J.....Waterbury
Nevins, John W.....Bridgeport
Olmsted, Richard W.....E. Hartford
Platt, Warren D. Jr.....Waterbury
Radowiecki, Micislaus W.....New Haven
Seronde, Joseph Jr.....Hamden
Spillane, Richard J.....Bloomfield
Wiese, Chester A. Jr.....Hartford
Witenberg, Earl G.....Middletown

Florida

Anderson, Thomas M.....Palm Beach
Donegan, Charles K.....Largo
Everett, Theodore.....Chipley
Kennedy, Alpheus T.....Pensacola
Moffett, James D. Jr.....Lake Wales
Schneider, Irvin C.....Chipley
Smith, Donald W.....Miami
Smith, Lynwood B.....Tampa
Witten, Victor H.....Jacksonville

Iowa

Arnold, Keith E.....Sibley
Bogle, Warren C.....Tama
Conlon, James B.....Council Bluffs
Conry, Robert F.....Waterloo
Geiger, Ulysses S.....No. English
Gray, Charles E.....Iowa City
Griffin, Richard P.....Sheldon
Hennessey, John M.....Missouri Valley
Irvine, Paul C.....Birmingham
Little, Charles R.....Cedar Rapids

Kansas

Brooks, Robert W.....Topeka
Carlson, Carl S.....Frankford
Coyle, John F.....Coffeyville
Critchfield, Thomas W.....Effingham
Decker, Albert I. Jr.....Lawrence
Emery, Frederic B.....Seneca
Fangman, Richard J.....Witchita
Humphrey, David C.....Mound Valley
Hunzicker, Warren J.....Lawrence
Padfield, Earl G. Jr.....Salina
Petterson, Perry D.....Topeka
Pfundt, Theodore R.....Holyroad
Schmidt, Alfred F.....Canton

Kentucky

Arnold, Sidney R.....Lexington
Baker, Carl G.....Somerset
Campbell, John (Jack).....Louisville
Ganem, John F.....Louisville
Isaacs, Avron M.....Louisville
Kirchner, Walter A.....Louisville
Rollings, Rae P.....Louisville
Van Meter, Jesse O. Jr.....Jackson

Maryland

Baum, Max.....Baltimore
Berman, Edgar F.....Baltimore
Cannon, Joseph P.....Baltimore
Day, Robert.....Laytonsville
Ermshar, Raymond.....Reisterstown
Fisher, William H. Jr.....Centreville
Geibel, Frank B. C.....Bethesda
Goldsmith, Jewett.....Baltimore
Hamman, Louis Jr.....Baltimore
Kardash, Theodore.....Baltimore
Larson, John D. Jr.....Bowie
Levine, Stuart C.....Baltimore
Lowitz, Irving R.....Baltimore
Lynn, William D.....Baltimore
McLean, Ross L.....Baltimore
Morris, Stanley F.....Greenbelt
Pudenz, Robert H.....Chevy Chase
Rawley, Clarence G. Jr.....Chestertown
Rhode, Charles M.....Baltimore
Rossberg, Clyde A.....Baltimore
Sadowsky, Wallace H.....North East
Scharffenberg, Wm. A.....Takoma Park
Seidel, David L.....Takoma Park
Thomas, James B.....Frederick
Truslow, John B.....Hyattsville
Watkins, Dayton O.....Hyattsville
Yaffe, Stanley N.....Baltimore

Minnesota

Amatuzio, Donald S.....Duluth
Dixon, Frank J. Jr.....St. Paul
Ellison, Adam B. C.....Rochester
Hall, Thomas N.....Grand Rapids
Hammar, Lawrence M.....Two Harbors
Haugen, George W.....Fergus Falls
Kelley, Kenneth J.....Red Lake Falls
Leitschuh, Thomas H.....Sleepy Eye
Lemon, Willia E.....Rochester
Linner, John H.....So. Minneapolis
McCarthy, Austin M.....Minneapolis
Mankey, James C.....St. Paul
Sanderson, David J.....Ah-Gwah-Ching
Schneider, John J.....Minneapolis
Smalley, Raymond E.....Rochester
Spurbeck, George H.....Cloquet
Steensgaard, Kermit L.....Fosston
Tice, George I.....Rochester
Twiss, Alston C.....Rochester
Zaworski, Leo A.....Minneapolis

Mississippi

Brown, Henry J.....Iuka
Burnham, Charles J.....Bay Springs
Burnham, Van Robinson Jr.....Ruleville
Dravin, Isadore.....Meridian
Ellis, Robert S.....Drew
Holder, Ernest J.....Prentiss
Holmes, Thomas W. Jr.....Winona
Holmes, Wendell B.....Tylertown
Johnson, Lee W. Jr.....Columbia
Kellum, Henry J. Jr.....Tupelo
Knapp, Brace I.....Picayune
Pegram, Max W.....Tupelo
Waldron, Willard L.....Water Valley

Missouri

Aiken, Richard F.....Marshall
Blasko, John J.....St. Louis
Brown, James L.....St. Louis
Eiseman, Ben.....St. Louis
Graves, Arthur J.....Harrisonville
Hickerson, William H.....Kansas City
Johnson, John E.....Kansas City
Lewin, Wilbur H.....Richmond Heights
Murphy, George E.....Kansas City
O'Brien, Edward C.....St. Louis
Shatz, Burton A.....St. Louis
Shea, Robert E.....St. Louis
Tolle, Robert L.....Webster Groves

New York

Adams, William S.....Sodus
Bakst, Alvin A.....New York
Beck, Richmond J.....Huntington, L. I.
Berry, George P.....Rochester
Bliss, Harry A.....Buffalo
Bobroff, Arthur.....New York
Bonnano, Salvatore V.....Long Island
Brayer, Franklin T.....Rochester
Bunnell, Chester W.....Hollis, L. I.
Calhoun, John C. Jr.....Brooklyn
Camelio, Albert P.....Rochester
Cannon, Vern E. Jr.....Elmira
Casey, Theodore A.....New York
Ciafone, Frank C.....Astoria, L. I.
Cohen, Sidney H.....Brooklyn
Cohn, George A.....Buffalo
Colombo, Antonio T.....Brooklyn
Davis, Herbert V.....Coppertown
De Polo, Edwin J.....New York
Duncan, Thomas .....Brooklyn
Elkin, David.....Brooklyn
Elkind, Maurice P.....Brooklyn
Fagan, William J.....Brooklyn
Fett, Hervert C. Jr.....Brightwaters
Flynn, Edward J.....Brooklyn
Fuchsman, Jacob J.....Bronx
Furman, Robert H.....Schenectady
Gallagher, Thomas F. Jr.....Brooklyn
Geer, Enos T. Jr.....Garden City
Geshlider, Norman A.....Brooklyn
Gilder, Rodman Jr.....New York
Gorman, Fred E.....Corning
Gotliffe, Stanley H.....Great Neck
Goulding, Allan L. Jr.....Mt. Vermon
Greenberger, Sidney.....Arverne, L. I.
Hall, William A.....Belmont
Hanssen, Elif C.....New York
Hasenbush, Lester L.....New York
Heimlich, Henry J.....New York
Herlihy, Vincent P.....New York
Hirsch, Donald R.....Forest Hills
Holbert, Duncan A.....Brooklyn
Jacobus, Raymond E.....Olean
Jacobziner, Harold.....Portchester
James, Melvin E.....New York
Johnston, Andrew.....Utica
Juskowitz, Norman B.....Bronx
Karl, Richard C.....Pelham Manor
Katz, Lawrence.....Brooklyn
Kay, Paul.....Brooklyn
Koppelman, Harold.....Brooklyn
Kratzman, Emil A. Jr.....Long Island
Kuhlke, John E.....Brooklyn
Lambert, Joseph J. Jr.....Woodhaven
Leversee, Beecher W.....Rexford
Levine, Harry H.....Brooklyn
McLeod, Stuart W.....Brighton
Manzella, Vincent J.....Bronx
Martin, William C.....New York
Marvin, George J.....Binghamton
Miller, Arthur.....Brooklyn
Montione, John F.....Rochester
Mook, William H.....Cooperstown
Mosig, Henry.....Brightwaters, L. I.
Murphy, William H.....Rockville Center
Nicosia, Arnold P.....Brooklyn
Noble, Robert P.....Riverdale
Osenkop, Richard S.....New York
Pariser, Harold P.....New York
Rashkoff, Ira A.....Bronx
Raybin, George I.....Brooklyn
Roberts, Frederick N.....Syracuse
Robins, Alvin L.....Brooklyn
Rogers, Martin C.....New York
Russell, Robert F.....Bronx
Salvia, Gaspare A.....New York
Sawyer, James D.....Dobbs Ferry
Scurti, Bernard V.....Brooklyn
Shapiro, Marvin I.....Brooklyn
Sheeran, A. D.....W. Hempstead, L. I.
Shelley, John H.....Forest Hills

MEDICAL OFFICERS RELEASED BY THE NAVY

New York—Continued

Spitzer, Stephen J.....Bronx
Stark, Raymond J.....Staten Island
Steinhorn, Paul.....Ulster Co.
Stoll, Julius Jr.....Rochester
Teicher, Joseph D.....New York
Trousdell, James N.....Glen Cove
Tuttle, Elmer H.....Rochester
Tyson, Cornelius J. Jr.....New York
Urban, Jerome A.....Brooklyn
Vainder, Milton.....New York
Voth, Irvin G.....Rochester
Wallace, William V.....Utica
Westfall, Stuart W.....Buffalo
Wilcox, Roscoe S.....Rochester
Zeifer, Herman D.....New York
Zoller, Philip A.....Richmond Hill

North Carolina

Bumgardner, Heath D.....Stanley
Davis, James E.....Goldsboro
Fowler, Richard L.....Greensboro
Harder, Frank K.....Greensboro
Harris, Russell P. Jr.....Newell
Heath, Hunter.....Kinston
Hester, Joseph M.....Wendell
Hewitt, Willard C.....Elizabeth City
Hughes, Jack.....Tabor City
Hunt, William J.....Thomasville
Lee, Francis B.....Monroe
Little, Joseph R.....Salisbury
Lynch, John F. Jr.....Erwin
Millard, David R. Jr.....Asheville
Parker, Edward P. III.....Camp Butner
Pound, William E.....Charleston
Taylor, George W. Jr.....Mooresville
Tillery, John G.....Wilson
Whitaker, Richard B. Jr.....Whiteville
Wilkerson, Joseph L.....Durham
Woodard, Marshall W.....Asheville
Wright, Isaac C.....Raleigh
Yelton, Ernest H.....Rutherfordton
Yow, Daniel E.....Concord

Ohio

Bickmore, John T.....Cincinnati
Borges, Wayne H.....Cleveland
Breytspraak, Roger W.....Middletown
Coffin, Scott F. Jr.....Mansfield
Cook, Thomas W.....Rocky River
Dew, Robert R.....Cleveland
Gallen, Joseph M.....Columbus
Gillman, Bernard D.....Cincinnati
Jones, Paxton L.....Youngstown
Kretchmer, Henry E.....Cleveland
Kuester, Allen E.....Cincinnati
Lede, Joseph H.....Cleveland
Moats, Dean T.....Sherwood
Mozola, Emil W.....Cleveland
Parker, Milton M.....Columbus
Pocock, Herman D. Jr.....E. Cleveland
Puleo, Anthony M.....Lorain
Rampp, Richard E.....Marietta
Ruehlmann, Carl G.....Cincinnati
Scheidt, John E.....Utica
Sharts, John E. Jr.....Franklin
Shea, Patrick C. Jr.....Cleveland
Ulevitch, Herman.....Cleveland
Willis, Charles E. Jr.....Cleveland

Oklahoma

Boatman, Jack H.....Okmulgee
Caldwell, Charles L.....Chelsea
Chesnut, Wylie G.....Miami
Dawson, Clarence B.....Muskogee
Downing, Gerald G.....Lawton
Dunn, Samuel C.....Norman
Hackney, Victor C.....El Reno
Kies, Benjamin B.....Okemah
Neal, James H. Jr.....Oklahoma City
Payne, Douglas W.....Edmond
Sanger, Walter B.....Miami
Walker, Granville I. Jr.....Hominy
Wallace, William W.....Holdenville
Winn, George L.....Oklahoma City

Pennsylvania

Arons, Henry.....Philadelphia
Beardsley, Frederick A. Jr.....Warren
Benson, Charles L.....Easton
Berger, Eugene.....Hazleton
Brzoza, Joseph J.....Philadelphia
Buchanan, James L.....Houston
Burgoon, Carroll F. Jr.....Harrisburg
Burros, Harry M.....Philadelphia
Carr, John G.....Pittsburgh
Chepko, Julius.....Greensburg
Coleman, Ernest H.....State College
Colley, Alfred L.....Sharon
Cucinotta, Salvatore.....Philadelphia
Davis, Edward W.....Norristown
DeCarlo, John Jr.....Philadelphia
Dill, James N. Jr.....McKeesport
Dixon, Harold M.....Philadelphia
Doane, Wilton A.....Philadelphia
Donaldson, William F. Jr.....Beaver
Dupertuis, Samuel M.....Pittsburgh
Eichman, Marcus E. Jr.....Philadelphia
Farkas, Robert W.....York
Finegold, Aaron N.....Pittsburgh
Fischer, Hadwin K.....Williamsport
Fitzgerald, James L. Jr.....Clarion
Fox, Joseph R.....Philadelphia
Gile, John H.....Philadelphia
Gorsuch, Paul L.....Newton Square
Gough, Edward J.....Narberth
Gross, Isadore.....Philadelphia
Grotzinger, P. J. G...Huntington Valley
Hall, William T.....W. Chester
Hood, Robert T.....Pittsburgh
Hoskins, John R. III.....W. Chester
Hudson, Robert J.....Latrobe
Kitei, Milton N.....Philadelphia
Leiter, Samuel S.....Philadelphia
Leskin, Joseph J.....Shenandoah
Le Strange, Thomas A.....Drexel Hill
Lieberman, Alexander Jr....Philadelphia
Litzenberger, Willard A.....Bethlehem
MacMillan, Howard C. Jr.....Aliquippa
Maguire, Elliott F.....Philadelphia
Maniglia, Angelo J.....Altoona
Martin, Richard J.....Drexel Hill
Rank, Frederic.....Clifton Heights
Rosenbaum, Leon Jr.....Philadelphia
Roskos, Andrew T.....Sharon
Sadler, John M.....Pittsburgh
Sausser, Eugene W.....Ashland
Sisson, Thomas R. C.....Upper Darby
Souder, Francis R.....Souderton
Starzynski, Thaddeus E.....Pittsburgh
Stewart, Charles R.....Wilkinsburg
Stiffel, Arthur.....Philadelphia
Thoroughgood, William C....Sharon Hill
Trimmer, Clifford S.....Yerkes
Walker, Leon R.....Hollidaysburg
Wenger, Christian S.....Ephrata
Whitney, Leslie W.....Peckville
Yamula, Stanley J.....Hazleton
Zeigler, Charles M.....Ellwood City

Texas

Adkins, Charles F.....Austin
Ameen, Ray C.....Lubbock
Anderson, Carter Jr.....Paris
Black, Gordon L.....El Paso
Bleakney, Philip A.....Harlingen
Bruce, Elmer I. Jr.....Longview
Dodd, George E. Jr.....Brownsville
Ellison, Alfred Jr.....Austin
Essin, Emmett M. Jr.....Sherman
Hutchins, Selwyn P. R.....Marlin
Jester, Albert W.....Houston
Knight, Melvin K.....Amarillo
Leonard, Russell J.....Houston
Nowierski, Leon W. Jr.....Yorktown
Padgett, Harold O.....Sealy
Robinson, James E. Jr.....Temple
Schoenvogel, Clarence W.....Brenham
Selmon, Tony B.....Stamford
Walton, Thomas O. Jr.....College Sta.
Wilson, Charles M...Jr.....Galveston

Virginia

Anthony, Russell A.....Staunton
Barr, William C.....Virginia Beach
Beazlie, Frank S. Jr.....Newport News
Campbell, Edward M.....Abingdon
Chance, Donald P.....Hagan
Clore, Jesse N. Jr.....Madison
Coleman, Ashby.....Lynchburg
Coleman, Custis L.....Richmond
Cook, Fred W. Jr.....Wellsburg
Cosby, Lewis F. Jr.....Abingdon
Crumpacker, Edgar L.....Williamsburg
Early, Julian Q.....Mt. Jackson
Etheredge, Samuel N.....Norfolk
Faulkner, Donald T.....Blackstone
Foster, Merritt W. Jr.....Williamsburg
Gallant, Joseph A.....Richmond
Hamilton, George R.....Williamsburg
Harrell, Gordon F.....Norfolk
Hawkins, Barry F.....Wytheville
Hoffman, Robert A.....Richmond
Hutcheson, Robert S. Jr.....Lexington
Keller, Guy O.....Buena Vista
Kunkle, Herman M.....Portmouth
Lewis, John L. Jr.....Alexandria
McAlpine, Robert E.....Portsmouth
Rawls, Charles H.....Suffolk
Saunders, Richard H. Jr.....Suffolk
Smith, Mason.....Richmond
Snead, James G.....Covington
Trice, Robert P.....Richmond
Whitlock, Lee E. Jr.....Norfolk

Washington

Anderson, Richard M.....Mt. Vernon
Casterline, Ray L.....Aberdeen
Jacobson, Bert P.....Mead
Maher, Frank M.....Seattle
Meyers, Henry J. Jr.....Seattle
Newell, James W.....Spokane
Retter, Richard H.....Toppenish
Talbot, Robert M.....Seattle
Tuell, Stanley W.....Tacoma

Wisconsin

Barina, Henry J.....Racine
Becker, Norman O.....Fond du Lac
Benson, Victor G.....Soldiers Grove
Brown, Frederick A.....Mt. Horeb
Burchill, Philip S.....Bremerton
Carlson, David J.....W. Allis
Erickson, Donald J.....Jonesville
Flanagan, Francis J.....Appleton
Foster, Thomas D.....Cornell
Gaenslen, Frederick G.....Milwaukee
Gormican, Maurice J.....Fond du lac
Hanson, Norbert O.....Bloomer
Hoessel, Arthur W.....Oshkosh
Hoffmann, George T.....West Allis
Holland, Homer J.....Berlin
Kagen, Louis.....Milwaukee
Kreul, Randolph W.....Racine
McCroskey, Robert C.....Milwaukee
Powell, Richard A.....Kenosha
Pulito, Frank J.....Milwaukee
Rubin, Phillip.....Milwaukee
Schuster, Daniel B.....Wauwatosa
Skroch, Eugene E.....Independence
Steffan, Lloyd J.....Malone
Waters, Darwin D.....Madison
Weber, Marshall L.....Milwaukee

Puerto Rico

Acevedo, Norberto.....Arecibo
Ayala, Angel M.....Manati
Rodriguez-Perez, Manuel...Puerto Rico
Scarano, Jenaro G.....Ponce
Torres-Aguilar, Luis R.....Caguas

Argentina

Elrick, Harold E.....Buenos Aires
Luikart, Carl B. Jr.....Argentina

Address Unknown

Embick, Richard P.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

First M.D. Degrees Awarded in Twenty-Six Years.—The Medical College of Alabama held its first annual commencement in Birmingham, October 25. According to Barbara Tucker, director of public relations of the medical school, representatives of the medical profession, state and national government, education and civic groups were in attendance to mark the first time in twenty-six years that M.D. degrees had been awarded in Alabama. The Medical College of Alabama opened officially June 4, 1945 with instruction in a junior class, and on October 8 of the same year the school of basic medical sciences on the university campus, established in 1920, where first and second years were given, was absorbed into the medical school. On this occasion the school of basic sciences ceased to exist. It was the direct successor in 1920 to the Medical College of Alabama at Mobile, organized in 1859. The new Medical College of Alabama was established by action of the 1943 state legislature as a division of the University of Alabama. It was located in Birmingham in 1944 by vote of a special governor's commission (THE JOURNAL, Aug. 11, 1945, p. 1116).

ARKANSAS

Henry Chenault Named Dean.—Dr. Henry C. Chenault, Hot Springs, has been appointed a vice president of the University of Arkansas and dean of the medical school, Little Rock. In the latter position Dr. Chenault will succeed Dr. Byron L. Robinson, Little Rock, who resigned, effective October 1, but who has agreed to remain with the school until January 1. Dr. Chenault graduated at Arkansas in 1927.

CALIFORNIA

Bequest for Cancer Research.—The University of California Medical School, San Francisco, will receive a bequest valued at $592,065 to carry on research for a cure of cancer. The benefaction is made possible from the estate of the late Albert C. Hooper, Palo Alto philanthropist. The University of California *Clip Sheet* reports that Mr. Hooper's uncle George Williams Hooper and his wife, Mrs. Sophronia Hooper, were responsible for the establishment at the university of the Hooper Foundation for Medical Research.

COLORADO

Grants for Research.—A grant of $3,000 was presented to Bernard B. Longwell, Ph.D., associate professor of biochemistry, University of Colorado School of Medicine, Denver, by the Ciba Company, manufacturers of pharmaceuticals and dyestuffs in New York. Dr. Longwell, in collaboration with Frank X. Gassner, D.V.M., professor of animal pathology at Colorado State College of Agriculture and Mechanic Arts, Fort Collins, is working on the possible extraction of hormones from animal feces for use in the treatment of sterility in cattle. A grant also was made to Dr. Harry H. Gordon, professor of pediatrics, by the Mead Johnson Company, Evansville, Ind. Dr Gordon is studying the metabolism of premature babies.

ILLINOIS

Citizens Vote for Health Units.—Seventeen counties in Illinois voted favorably by heavy majorities, November 5, for the inauguration of full time county health units. The seventeen counties include one four county unit and three bicounty units. The proposition was lost only in Rock Island County, it was reported. Altogether twenty-two counties have now adopted county health department laws. When organized, two thirds of the population of the state will be under full time county and municipal health service. The seventeen counties voting recently are Alexander-Pulaski (bicounty unit), Effingham, Fulton, Hardin-Pope-Massach-Johnson (multiple county unit), Lawrence-Wabash (bicounty unit), Lee, Morgan, Peoria, Piatt-DeWitt (bicounty unit), Shelby and Will.

Experimental Study in Influenza Vaccine.—The Illinois State Department of Public Health and the Universities of Illinois and Northwestern and the state normal schools at Carbondale and DeKalb are cooperating in studies to determine the value of influenza vaccine. Students at the institutes are being offered the vaccinations on a voluntary basis. A comparison of the incidence of the disease in those who accept the vaccination and those who do not will help to establish the effectiveness of the influenza vaccine. In a statement to the press, Dr. Roland R. Cross, state director of public health, said that, although the department of public health is not able to offer free influenza vaccine to all, many physicians will no doubt wish to administer it to their private patients.

Chicago

Personal.—Dr. David J. Davis, recently retired as dean of the University of Illinois College of Medicine, on November 1 was elected chairman of the Municipal Tuberculosis Sanitarium, filling the vacancy that occurred with the resignation of Dr. Frederick Tice more than a year ago. Dr. Earl E. Kleinschmidt, head of the Tuberculosis Institute of Chicago and Cook County, was named secretary. Harry Reynolds was reelected vice president and will continue to serve as business manager.

Electrocardiographic Interpretation.—A course in electrocardiographic interpretation for graduate physicians will be given at the Michael Reese Hospital Postgraduate School by Dr. Louis N. Katz, director of cardiovascular research. The class will meet each Wednesday for twelve weeks, beginning February 12. Further information and a copy of the lecture schedule may be obtained on application to the office of the dean, Michael Reese Hospital Postgraduate School.

La Rabida Sanitarium Observes Fiftieth Anniversary.—The La Rabida Jackson Park Sanitarium observed its fiftieth anniversary October 15 by launching a "research drive" aimed at discovering the cause and prevention of rheumatic fever. A fund of $37,500 was pledged or donated to carry on the study, which will be under the supervision of the sanitarium medical director, Jesse W. Hofer, Ph.D. It is hoped to establish six fellowships in the medical schools of Chicago, Northwestern, Illinois and Loyola, as well as in the laboratory of the sanitarium.

Changes in Northwestern Faculty.—Ray S. Snider, Ph.D., for twenty-six months senior pathologist and biologist with the atom bomb project at Oak Ridge, Tenn., and senior monitor and pathologist of Joint Task Force I at Bikini, has been appointed associate professor of anatomy at Northwestern University Medical School. Dr. Jules H. Masserman, assistant professor of psychiatry and research associate, Otho Sprague Institute, University of Chicago, has been named assistant professor of nervous and mental diseases and John M. Brookhart, Ph.D., assistant professor of physiology, University of Illinois College of Medicine, has been named assistant professor of neurology, effective January 1.

Research Fellowships.—The Graduate School of the University of Illinois has established four research fellowships to be awarded for one year in the fields of medicine, dentistry and pharmacy in Chicago at a stipend of $1,200 a year (calendar year with one month's vacation). Fellows are eligible for reappointment in competition with the new applicants. Candidates for these fellowships must have completed a training of not less than eight years beyond high school graduation. Candidates should indicate the field of research in which they are interested and submit complete transcripts of their scholastic credits, together with the names of three former science teachers as references. Appointments will be announced January 1 or soon thereafter each year. The fellowship year begins September 1 or July 1. Formal application blanks may be secured from the Secretary of the Committee on Graduate Work in Medicine, Dentistry and Pharmacy, 1853 West Polk Street, Chicago 12.

INDIANA

Hearing on "Diabetic Institute."—On October 12 Dr. Peter S. Kaadt, at present head of the Kaadt Institute, South Whitley, was cleared of charges of noncompliance with state hospital licensing requirements, according to the Indianapolis *News*. In answer to the charge that he had failed to obtain a license for the institute, Dr. Kaadt said he was conducting a private physician's practice and did not come under the purview of the council. Charges that he had kept bed patients in the building more than twenty-four hours and that he had been serving meals in conjunction with the treatment were termed incorrect by Dr. Kaadt. He said that practice had been discontinued when he first took charge July 31, the *News* reported. He said he did, however, make meals available for those who wished to stay. On the strength of investigation at the hearing Dr. Kaadt was advised by the Indiana Council for Hospital Licensure that, subject to the discontinuance of meal servings

and the use of hospital bed facilities for treatment, he was not required to license the establishment. Charges have been levied against Dr. Charles F. Kaadt, brother of Dr. Peter Kaadt, for the administration of an alleged cure for diabetes at the institute. The Indianapolis Better Business Bureau, which has made the charges, alleges that several persons have died as a result of the treatment. Dr. Charles Kaadt, who is reported to be in Tennessee recovering from anemia (THE JOURNAL, October 5, p. 296), won a ninety day delay in the hearing of charges on maladministration of a "diabetes cure," the *Star* stated. The Indiana Council for Hospital Licensure is a new state board of health agency, created under the 1945 licensing act.

MARYLAND

Resolution Honors the Late Phillips Goldsborough.—The Maryland State Department of Health at its meeting October 24 adopted a resolution of sympathy on the death of Hon. Phillips Lee Goldsborough, acknowledging his leadership. The resolution states that during his term of office as governor he had frequent discussions with his brother, Brice W. Goldsborough of Cambridge, one of Maryland's leading practitioners and a former president of the Medical and Chirurgical Faculty of Maryland, relative to the bettering of the health conditions of the citizens of Maryland. Finally, the resolution points out, Governor Goldsborough introduced legislation some thirty years ago for the establishment of a deputy state health officer in each county. He was successful and eventually all counties had deputy state health officers assigned to them. Thanks to the wise statesmanship of Governor Goldsborough, Maryland was one of the first states in America to have full time deputy state health officers.

Reginald Archibald Named Professor of Biochemistry.—Dr. Reginald M. Archibald, associate at the Rockefeller Institute for Medical Research, New York, and special investigator at the hospital, has been appointed professor of biochemistry at the Johns Hopkins University School of Hygiene and Public Health, Baltimore, filling the vacancy created by the retirement of Elmer V. McCollum, Sc.D. Dr. Archibald will place primary emphasis on biochemistry as related to human nutrition, both in the laboratory and in actual practice. Graduate students at the school, along with Dr. Archibald and staff, will approach nutrition problems in the laboratory from the point of view of study of the influence of minerals, vitamins and hormones on the activity of enzyme systems in human beings and in organisms such as bacteria and larger parasites which infect man. This study, Dr. Archibald points out, will also call for the development of improved methods for the determination of hormones and vitamins. Mrs. Elmer V. McCollum, wife of the retired head of the department, will remain as assistant professor and will continue her work on studies of animal nutrition.

MASSACHUSETTS

Hugo Muench New Head of Biostatistics.—Dr. Hugo Muench, professor of biostatistics, Harvard University School of Public Health, Boston, has been appointed head of the department of biostatistics, it was announced November 8. Dr. Muench is also assistant dean. Dr. Muench was formerly a member of the staff of the International Health Division of the Rockefeller Foundation, New York.

The Dunham Lectures.—"Biochemical Lesions and British Anti-Lewisite" was the theme of the Edward K. Dunham Lectureship for the promotion of the medical sciences at Harvard Medical School, Boston, November 18, 20 and 22. In the series Dr. Rudolph A. Peters, Whitley professor of biochemistry, University of Oxford, England, discussed the significance of biochemical lesions, the arsenical lesion and its antidote, and clinical applications and development of BAL.

Meeting of Obstetrics and Gynecology Society.—The eighteenth annual meeting of the New England Obstetrical and Gynecological Society was held at the Hotel Somerset, Boston, October 30. Various clinics comprised the program, and speakers in an afternoon program included:

Dr. Alonzo K. Paine, Boston, The Posterior Occiput.
Dr. James C. Janney, Boston, The Doctor's Responsibility in Preparation for Marriage.
Dr. George V. S. Smith, Brookline, Discussion of Hormone Therapy in the Prevention of Miscarriage and Other Aspects of Pregnancy.

Fellowship Goes to Thomas Paine.—The American College of Physicians has awarded a research fellowship to Dr. Thomas F. Paine Jr., Cambridge, for the year beginning July 1. The fellowship provides for the continuation during this period of the study of infectious diseases, with particular regard to chemotherapy and the use of antibiotics, in which Dr. Paine is currently engaged at the Thorndike Memorial Laboratory, Boston City Hospital, under the supervision of Dr. Maxwell Finland. Dr. Paine graduated at Vanderbilt University School of Medicine, Nashville, in 1942. After his internship at the Strong Memorial Hospital, Rochester, N. Y., in 1943 he entered the Medical Corps, Army of the United States. From November 1945 to May 1946 Dr. Paine was assigned as Post Surgeon, CO Station Hospital, Camp Detrick, Frederick, Md., and there participated in clinical and laboratory studies of infectious diseases.

Psychiatric Department Expanded.—Boston University School of Medicine has expanded its department of psychiatry with six new appointments and one promotion. The appointments are:

Dr. John M. Murray, professor of clinical psychiatry.
Dr. George E. Gardner, associate professor of psychiatry.
Dr. Marian C. Putnam, instructor in psychiatry.
Dr. Beata Rank, assistant in psychiatry.
Dr. Benjamin Cohen, instructor in psychiatry.
Dr. Elvin V. Semrad, assistant professor in medicine (promotion).
Dr. Frederick Rosenheim, assistant professor of psychiatry.

As a part of the program of expansion the number of hours of psychiatric instruction has been more than doubled and students will begin their training in psychiatry in the first year. Work of the department will be integrated with that of the departments of internal medicine, surgery and pediatrics at the school of medicine and its affiliated hospitals. Students will visit the Judge Baker Center and the Children's Center as well as work in the wards with the patients.

Putnam Fellowship for Advanced Research.—Radcliffe College invities applications for the Helen Putnam Fellowship for Advanced Research. The committee on award would be interested in receiving nominations immediately from eligible women scholars who have research in progress in the field of genetics or of mental health, broadly defined. The fellowship will pay a stipend of $2,000, and the tenure of the fellowship will run for a term of eleven months from Oct. 1, 1947, with the possibility of a renewal for a similar period. All normal laboratory facilities will be provided to the holder of the fellowship. Each fellow will be assigned room and board (at cost) in one of the Radcliffe graduate houses and will be expected to be in residence during the tenure of the fellowship. No restrictions as to age will be imposed by the committee on award. In general, however, the committee will limit its choice to mature women scholars who have gained their doctorate or who possess equivalent qualifications. Applications for the award should be submitted to Radcliffe College not later than April 1, 1947 and the announcement of the appointment to the fellowship will be made on or about May 1, 1947. Application forms may be secured by addressing the Committee on the Helen Putnam Fellowship for Advanced Research, Radcliffe College, Cambridge 38, Mass.

MICHIGAN

State Medical Election.—Dr. Patrick L. Ledwidge, Detroit, was named president-elect of the Michigan State Medical Society at its recent meeting in Detroit, and Dr. William A. Hyland, Grand Rapids, was installed as president. Dr. L. Fernald Foster, Bay City, was reelected secretary.

Cancer Committee Expands.—Feeling that the time had arrived to coordinate as far as possible all cancer control activities so as to avoid duplication of effort and expense, Dr. William A. Hyland, Grand Rapids, president of the Michigan State Medical Society, has enlarged the cancer control committee this year to include the members of the Professional Executive Committee of the American Cancer Society, Michigan division, and representatives of the Michigan Department of Health. Under the chairmanship of Dr. Norman F. Miller, Ann Arbor, three subcommittees have been formed to study the problems of lay and professional education, the collection and disbursement of funds for cancer control and the extent of the cancer problem in Michigan together with the needs of local areas to render a more competent and adequate service to cancer patients. Dr. Frank L. Rector, a member of the Ingham County Medical Society, has been appointed as full time secretary with offices at 1313 East Ann Street, Ann Arbor. For the past five years Dr. Rector has been in charge of the cancer program of the Michigan Department of Health and has devoted most of his time to cancer education. The Michigan Department of Health has been allocated $86,000 of federal funds through the U. S. Public Health Service this year for cancer control activities in this state. The American Cancer Society, Michigan division, also will have greatly increased funds at its disposal. The cancer control committee will help plan programs and expenditure of these funds as well as offer a

general information service on cancer problems in Michigan and elsewhere. As far as known, the Michigan State Medical Society is the first state medical society to employ a full time medically trained secretary to carry on its cancer control activities.

MINNESOTA

Students in Experiment to Study Aging Process.—The University of Minnesota, Minneapolis, is using 400 persons as voluntary "guinea pigs" to determine the process of aging of man. Half of the group will be university students between 18 and 20 years whose homes are in Minneapolis and St. Paul, while the other half are men between 45 and 60. The experiment will be under the direction of Ancel B. Keys, Ph.D.

Change in Constitution for Surgical Membership.—On October 3 the Minneapolis Surgical Society amended its constitution to read that candidates for active membership must be practicing in Minneapolis, must have graduated in 1936 or thereafter, must first be certified by the American Board of Surgery, must be fellows of the American College of Surgeons in good standing, limiting their practices to general surgery, and must have published at least one surgical paper in a resognized medical journal. The old amendment that candidates for active membership must be practicing in Minneapolis and should only be fellows of the American College of Surgeons practicing general surgery or general surgeons who have fulfilled the minimum requirements of the American College of Surgeons and are limiting their practice to surgery shall be eligible for election as active members. Both the old and the new amendments provide that the active membership should be limited to fifty.

OHIO

Appointments in Mental Hygiene.—Dr. Mark W. Garry, formerly of Milwaukee, since 1945 director of the tuberculosis division of the Ohio State Department of Health, has been appointed chief of tuberculosis and internal medicine in the division of mental hygiene, Ohio State Department of Public Welfare, effective October 16. Dr. Garry will be in charge of tuberculosis control and treatment in the institutions and will also be responsible for organizing the medical program of the institutions in the division. Miss Anna T. Lownie, R.N., director of the postgraduate school of psychiatric nursing, Menninger Sanitarium, Topeka, Kan., has been named chief of nursing service and education in the division of mental hygiene, and Wallace C. Fotheringham, M.A., a member of the staff of Muskingum College, has been named chief of institutional personnel training.

Prentiss Award Goes to Mary Connolly.—The 1946 Elisabeth S. Prentiss National Award in Health Education will be presented to Miss Mary P. Connolly, Dushore, Pa., lecturer and director of health education, University of Michigan School of Public Health, Ann Arbor, for her "down to earth pioneering" in Detroit. The award committee recognized her pioneering in the organization of 15,000 women into the Mother and Daughter Council, work in the Detroit Evening Schools for the foreign born, development of health guilds (one for Negro women now has fifty-seven units in Negro churches), education for food handlers, neighborhood classes for child care, person to person education regarding venereal diseases, with pool rooms, bowling alleys and beer parlors for classrooms. Miss Connolly is one of the group instrumental in establishing and maintaining the health education institute held annually in connection with the annual public health association meeting. The presentation was announced November 13 at a dinner meeting of the American Public Health Association by Dr. William W. Peter, chairman of the National Advisory Council of the Cleveland Health Museum. November 13 was the sixth anniversary day of the museum's opening in 1940 and the tenth year since its incorporation in 1936. Elisabeth S. Prentiss, in whose honor the award was named, provided the original home and a substantial trust fund for the first health museum in America. Expanding activities due to requests from health educators throughout the world made a move to larger quarters necessary early this year (THE JOURNAL, February 16, p. 438).

WASHINGTON

New Health Department.—Bellingham and Whatcom County will probably enjoy the advantages of a full time health department by January 1 as the result of recent action by the city council and county commissioners, it is reported. A $60,000 budget is planned for the new department, which will replace the two part time departments now operated by the city of Bellingham and Whatcom County. The staff, to be headed by a full time health officer trained in public health, will total eighteen persons and include a nursing supervisor and nine public health nurses. Dr. Harrison Garner Wright is head of the present Whatcom County Health Department, while Dr. Calvin L. Longstreth is Bellingham city health officer.

The Health Commentator.—The Washington State Department of Health, Seattle, on October 15 brought out the *Health Commentator* as its official bulletin. Howard W. Lundy, Dr.P.H., is editor and Seymour Standish Jr. managing editor of the monthly bulletin.

State Medical Election.—Dr. Albert J. Bowles, Seattle, was chosen president-elect of the Washington State Medical Association at its recent meeting and Dr. Ross D. Wright, Tacoma, was installed as president. Other officers are Dr. Alexander H. Peacock, Seattle, vice president, and Dr. Harold E. Nichols, Seattle, secretary-treasurer.

ALASKA

Health Departments Established.—The Anchorage City Council passed the first ordinance to create a city health department. On July 1 the city's health budget was increased and supplemented by funds from the Territorial Department of Health. It now provides for a full time sanitarian and an increase in the nursing staff from two to three nurses. In August the city of Fairbanks appointed its first medical health officer. This office in the past has been held by the chief of police. The venereal disease clinics, formerly conducted by a medical officer from the nearby army post, were moved to the city's health center. Monthly immunization clinics have also been added to the city's health services. The Juneau health center, which formerly occupied a small room in the Territorial Building, has been moved to a separate building with the aid of the Juneau Health Council.

GENERAL

Grant Aids Expansion of Journal.—The American Foundation of Tropical Medicine has obtained $3,800 to enlarge its journal temporarily. The bulk of the money, $3,000, was a grant from the Coolidge Foundation and will allow the publication to use a considerable number of papers concerning observations on the tropical diseases during World War II.

Special Society Election.—Dr. Clarence E. Van Epps, Iowa City, was chosen president of the twenty-fifth anniversary meeting of the Central Neuropsychiatric Association at its meeting in Denver, October 4-5. Other officers include Dr. Jack R. Ewalt, Galveston, vice president; Dr. William C. Menninger, Topeka, secretary-treasurer, and Dr. Abram E. Bennett, Omaha, counselor.

Proctologic Prize Goes to Harold Courtney.—The American Proctologic Society has awarded its annual Hermance Award to Dr. Harold Courtney, Syracuse, for "an outstanding scientific paper in the field." The paper was entitled "The Posterior Levator Space: Its Relation to Postanal Infections" and was presented before the 1946 session of the society at its meeting in San Francisco in June.

Accruals of Blood Service for Voluntary Hospitals.—On October 7 the trustees of the Blood Transfusion Association voted to make use of accruals resulting from the operation of the blood bank to provide the voluntary hospitals using the service with blood free of charge for indigent patients requiring transfusions. For the first months 150 units of blood have been placed at the disposal of the hospitals for this purpose. The Blood Transfusion Association, of which Dr. DeWitt Stetten is president, has offices at 2 West 106th Street, New York 25.

Council of Jewish Tuberculosis Institutions Dissolved.—The National Council of Jewish Tuberculosis Institutions was dissolved as of November 1. Communications regarding the individual member institutions should be sent direct to them at the following addresses:

Ex-Patients' Tubercular Home of Denver, 8000 East Montview Boulevard, Denver.
National Jewish Hospital at Denver, 3800 East Colfax Avenue, Denver.
Jewish Consumptive Relief Association, 208 West 8th Street, Los Angeles 14.
Committee for Care of Jewish Tuberculous (Altro Work Shops), 71 West 47th Street, New York.
Deborah Sanatorium, Browns Mills, N. J.
Winfield Sanatorium, Winfield, Ill.
Montefiore Hospital for Chronic Diseases, Gun Hills Road, New York.
Montefiore Hospital Country Sanatorium, Bedford Hills, New York.

Graduate Course for American Physicians.—Dr. Julian Landman, 62 Queen Anne Street, London, England, arrived in New York October 21 to arrange postgraduate courses in London for American physicians. Dr. Landman's address while in New York is care of the City Farmers Bank Trust Company, 22 William Street. According to a communication from

Dr. Landman arrangements have been made with postgraduate hospitals and teachers in London to provide postgraduate tuition in clinical medicine, surgery, ophthalmology and ear, nose and throat diseases. For these general courses there will be vacancies for about fifty members during each of the months of May, June, July, August and September 1947. In correspondence to the editor, the *British Medical Journal*, September 7, page 345, published a letter from Dr. Landman discussing the proposed postgraduate courses.

Lasker Awards.—Presented to the American Public Health Association by the Albert and Mary Lasker Foundation, the first series of Lasker Awards for advances made during the past five years were presented at the seventy-fourth meeting of the public health association in Cleveland, November 12. The awards consist of five individual awards of $1,000 each together with a gold statuette of the Winged Victory of Samothrace, symbolizing a victory in the fight against disease and death. During the deliberations of the awards committee it became evident that methods of medical research are changing to such an extent that the manner of recognition must be changed or broadened. Some important discoveries in medicine in the past few years were not the work of a single man but of large groups of men and women working together against time to solve a specific problem. For that reason the committee decided to add five group awards to the originally planned individual awards. These awards are in the form of a citation and a Winged Victory statuette in silver presented to the administrative leader of the group. As in the case of the individual awards, these statuettes will be suitably inscribed on the base. The first individual award winner is Dr. Carl F. Cori, St. Louis, for contributions to our knowledge of carbohydrate embolism culminating in the clarification of insulin action. Dr. John F. Mahoney, a senior surgeon, U. S. Public Health Service, stationed at the U. S. Marine Hospital, Staten Island, N. Y., received an award for research into the penicillin treatment of syphilis. Dr. Mahoney is credited with publishing three years ago the first account of the use of penicillin in the treatment of syphilis. One award went to three men jointly who were responsible for the discovery of the Rh factor. These recipients are the late Dr. Karl Landsteiner, the honor to be received by his son Ernest; Dr. Philip Levine, Plainfield, N. J., director of the biologic division, Ortho Research Foundation, Linden, N. J., and Dr. Alexander S. Wiener, Brooklyn. Dr. Alfred N. Richards, professor of pharmacology, University of Pennsylvania School of Medicine, Philadelphia, received the award for his work in World War II as chairman of the committee on medical research of the U. S. government's Office of Scientific Research and Development. Dr. Fred L. Soper, associate director of the international health division, Rockefeller Foundation, received the fifth of the individual Lasker awards for his successful fight against malaria and yellow fever. In presenting the Lasker group awards the committee had some difficulty in getting representatives of the five groups to accept the awards. In each case the director of the group felt that no one man was in a position to accept such an honor, for the contribution that had been made was a result of the combined efforts of many men and women working together. However, representatives of the groups were prevailed on finally to accept the silver statuette. The first group to receive a silver statuette is the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture for its work in controlling insect borne diseases and particularly for its research on DDT. Fred C. Bishopp, Ph.D., assistant chief of the bureau, will accept the award in the name of the group. The Army Epidemiological Board is the second winner of a Lasker group award for its work in the control of infectious diseases, one aspect of which was its development of an effective vaccine against influenza. Dr. Francis G. Blake, dean of the Yale University School of Medicine, New Haven, was the chairman of the group and will accept the award. The National Institute of Health of the U. S. Public Health Service is the third winner of a Lasker group award. This organization is the research laboratory of the U. S. Public Health Service. Dr. Rolla E. Dyer, director of the institute, will accept the award for the group. The Northern Regional Research Laboratory of the Department of Agriculture is the recipient of the fourth Lasker group award, being given for studies leading to the mass production of penicillin. Dr. Guido E. Hilbert, present director of the laboratory, will accept the award for this group. The final Lasker group award went to the Board for the Coordination of Malarial Studies for its work leading to the development of new and effective agents for the prevention of malaria.

CANADA

New Professor of Gynecology at Toronto.—Dr. Herman B. Van Wyck, Toronto, Ont., has been appointed professor of gynecology and obstetrics at the University of Toronto Faculty of Medicine, succeeding Dr. William A. Scott, who is retiring. Dr. Scott will continue in private practice and as main board examiner in the medical council of Canada.

University News.—Louis B. Jaques, Ph.D., has resigned from the department of physiology, University of Toronto Faculty of Medicine, Ontario, to become professor and head of the department of physiology, University of Saskatchewan, Saskatoon, Canada. The medical school has been reorganized and will from now on give a full four year course.

Grant for Research in Endocrinology.—A grant of $47,000 has been made to the Institute of Experimental Surgery and Medicine, University of Montreal, Quebec, to assist in the work of Dr. Hans Selye, who recently organized the department of endocrine research as professor and director of the institute. Dr. Selye, whose work has been concentrated on the steroid field, received his M.D. at the University of Prague in 1929. In 1931 he worked in the department of biochemical hygiene at the Johns Hopkins University School of Medicine, Baltimore, under a Rockefeller research fellowship.

The Charles Mickle Lecture.—Bernardo A. Houssay, professor of physiology, University of Buenos Aires, delivered the annual Charles Mickle Lecture, September 19, on "Alloxan Diabetes." Dr. Houssay delivered the lecture in his holding of the Charles Mickle Fellowship, which he was awarded in 1945. The fellowship is given annually by the University of Toronto Faculty of Medicine to "that member of the medical profession who is considered by the council of the faculty of medicine to have done most during the preceding ten years to advance sound knowledge of a practical kind in medical art or science."

Immunization Week.—The Health League of Canada announced that the fourth National Immunization Week was observed during the week beginning September 29. The league reports that there was an improvement in the general overall health picture in Canada. For instance, there were 2,786 cases of diphtheria in 1945 against 3,211 in 1944, 11,928 cases of scarlet fever against 20,945 and 12,192 cases of whooping cough against 12,382. Statistics on deaths are available for only the first nine months of 1945, and, with the exception of whooping cough, the fatality rate from these particular diseases also shows a drop. However, there were 325 whooping cough deaths in the first nine months of 1945 compared with 333 for all of 1944.

CORRECTION

Woman's Medical College of Pennsylvania.—In the State Board Number of THE JOURNAL, May 11, 1946, page 111, the percentage of failures of graduates of the Woman's Medical College of Pennsylvania before medical licensing board examinations was reported as 15.0. One candidate was successful in New York but applied too late for the anatomy and physiology examination and was reported among the failures. In computing the state board statistics the procedure is to omit incomplete examination results. Thus the percentage of failures for this school should have been 10.5. Of the 19 graduates examined, 2 failed.

Marriages

JAMES AUSTIN DAVIS JR., Bessemer, Ala., to Miss Mary Katherine Pappandreou of Fredericksburg, Va., July 1.

KENNETH HILL HERBERT, Mount Pleasant, S. C., to Miss Stella Virginia Pope of Dade City, Fla., June 20.

FRANK CUTCHIN BONE, Rocky Mount, N. C., to Miss Margaret Leigh Lowrance of Durham, July 6.

MOYLAN BERNARD KEHOE, Flint, Mich., to Miss Eileen Elizabeth O'Brien in Normandy, Mo., in June.

JAMES ANDREW CLARK JR., Ruleville, Miss., to Miss Margaret Ellen Smith of Amite, La., June 5.

HOWARD HUNTER NICHOLS, Nashville, Tenn., to Miss Betty Jane Martin of Jackson, Miss., July 1.

WILLIAM C. VAN BUSKIRK, Boston, to Miss Vivian Morton of Warrensburg, Mo., in June.

JOSEPH STUART STALEY to Miss Dorothy Maxine Thomas, both of Marion, Va., May 31.

Deaths

Hatch Whitfield Cummings, Hearne, Texas; University of Tennessee Medical Department, Nashville, 1892; born in Aberdeen, Miss., Sept. 14, 1869; member of the American Medical Association and in 1930 a member of its House of Delegates; past president and for many years a member of the Texas State Board of Medical Examiners; past president, chairman of the section on state medicine and public hygiene in 1910 and again in 1919, at one time a member of the committee on legislation and public instruction, and councilor of the Eleventh District in 1906-1907 and 1907-1908, State Medical Association of Texas; one of the organizers and first president of the Brazos Valley Medical Association in 1896; a charter member of the Brazos-Robertson Counties Medical Society, which he served as president from 1927 through 1931; member of the state board of health from 1909 to 1911; health officer; for many years president of the school board; served as president of the Hearne Building and Loan Association, the Planters and Merchants State Bank and the Chamber of Commerce; for many years served as local surgeon for the Missouri Pacific and Southern Pacific railways; died July 29, aged 76, of arteriosclerosis.

Warren Kidwell Stratman-Thomas, Madison, Wis.; University of Wisconsin Medical School, Madison, 1928; born in Dodgeville, Wis., June 19, 1894; at one time assistant bacteriologist and research pharmacologist at the University of Wisconsin; in 1928 made a study of sleeping sickness in the Belgian Congo under a special fellowship created by the Guggenheim Memorial Foundation, the University of Wisconsin and the Parke Davis Laboratories; formerly member of the staff of the International Health Division of the Rockefeller Foundation and director of the bureau of malaria control at Nicosia, Cyprus; served as malariologist for the Tennessee State Department of Health and as assistant professor of preventive medicine at the University of Tennessee College of Medicine in Memphis; served during World War I and with the tropical medical service of the navy during World War II; at one time affiliated with the Florida State Board of Health; died in St. Mary's Hospital August 16, aged 52.

Theodore Lasater Terry ✦ Boston; University of Texas School of Medicine, Galveston, 1922; born in Ennis, Texas, on Feb. 19, 1899; assistant professor of ophthalmology at the Harvard Medical School and the graduate school; at one time on the faculty of his alma mater; diplomate of the National Board of Medical Examiners; specialist certified by the American Board of Ophthalmology, of which he had been assistant secretary; member of the American Academy of Ophthalmology and Otolaryngology, American Association for the Advancement of Science, and American Ophthalmological Society; member, past president and secretary of the New England Ophthalmological Society; member and trustee of the Association for Research in Ophthalmology; on the staffs of the Massachusetts General Hospital and the Massachusetts Eye and Ear Infirmary; elected president of the Foundation for Vision, of which he had been one of the founders; died September 28, aged 47.

Frank Wilson Jr., Raleigh, N. C.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1932; born in Greenville, N. C., June 30, 1909; served an internship and residency at the University Hospital in Baltimore and a residency at the Baltimore City Hospitals; received additional training at the U. S. Marine Hospital in Baltimore; member of the American Medical Association; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; began active duty as a captain in the medical corps, Army of the United States, on July 21, 1942; service terminated in July 1946 with the rank of major; on the staffs of the Rex and St. Agnes hospitals; consulting surgeon of the State Hospital and the Seaboard Air Line Railroad; member of the Raleigh Rotary Club; died in the Duke Hospital, Durham, September 22, aged 37, of influenza and encephalomyelitis.

Joseph C. Anderhub, Chicago; Ludwig-Maximilians-Universität Medizinische Fakultät, Munich, Bavaria, Germany, 1889; St. Louis College of Physicians and Surgeons, 1892; died at the Little Sisters of the Poor August 23, aged 83, of generalized arteriosclerosis.

Robert Vivian Baker, Camarillo, Calif.; Rush Medical College, Chicago, 1922; member of the American Medical Association; affiliated with the Camarillo State Hospital; died August 25, aged 52, of coronary occlusion.

Joseph Rolla Baldwin, Des Moines; University of Pennsylvania Department of Medicine, Philadelphia, 1898; died August 31, aged 83, of cerebral hemorrhage.

Richard Francis Barrett, Shrewsbury, Mass.; University of Bishop College Faculty of Medicine, Montreal, Que., Canada, 1904; died August 13, aged 75, of myocardial degeneration.

Arthur Clifton Conro, Attleboro, Mass.; Chattanooga (Tenn.) Medical College, 1901; member of the American Medical Association and the New England Otological and Laryngological Society; died in Boston July 18, aged 76, of carcinoma of the liver.

Mary Fisher DeKruif, Wellesley, Mass.; University of Michigan Medical School, Ann Arbor, 1916; affiliated with Simpson Infirmary of Wellesley College; died May 8, aged 57, of carcinomatosis.

William Alva Earle, South Brooksville, Maine; Bennett College of Eclectic Medicine and Surgery, Chicago, 1879; died in Brookline, Mass., March 26, aged 88, of cerebral arteriosclerosis.

William Henry Greeley, Weymouth, Mass.; College of Physicians and Surgeons, Boston, 1884; died in Holbrook April 3, aged 87, of mitral regurgitation.

Edwin Ball Hailey ✦ Conroe, Texas; University of Texas School of Medicine, Galveston, 1932; interned at the John Sealy Hospital in Galveston; president and formerly secretary of the Montgomery County Medical Society; died July 16, aged 40.

Ralph Ritter Higgins, Fall River, Mass.; Boston University School of Medicine, 1946; commissioned a lieutenant (jg) in the U. S. Naval Reserve; served an internship at the Medical College of Virginia, Hospital Division, in the capacity of a rotating intern at the Raiford Hospital in Franklin, Va., where he died July 27, aged 25, of injuries received in an automobile accident.

William Howe, Las Vegas, N. M.; Baltimore Medical College, 1898; member of the American Medical Association; died in July, aged 73.

George Franklin Jewett, White Salmon, Wash.; Starling Medical College, Columbus, 1882; died in Portland, Ore., September 20, aged 88.

Joseph Francis Kenney, Milwaukee; Milwaukee Medical College, 1908; on the staffs of St. Joseph's and West Side hospitals; affiliated with the Veterans Administration; died September 18, aged 60, of dissecting aneurysm of the aorta due to arteriosclerosis.

Joseph V. Kofron, Cleveland; Western Reserve University Medical Department, Cleveland, 1893; member of the Cleveland Academy of Medicine; affiliated with the Cleveland Medical Library Association, of which he had been a founder; for many years on the staff of St. Alexis Hospital; died in Chagrin Falls, Ohio, September 20, aged 76, of cerebral hemorrhage and asthmatic bronchitis.

Paul Lilja Lane, Chicago; University of Illinois College of Medicine, Chicago, 1941; interned at the Augustana Hospital; also a graduate in dentistry; died in Framingham, Mass., July 13, aged 48.

George Franklin Libby, Fillmore, Calif.; Medical School of Maine, Portland, 1891; honorary member of the Colorado State Medical Society; member of the American Medical Association and the American Ophthalmological Society; formerly secretary of the Colorado Ophthalmological Society; served on the staffs of the Mercy and St. Anthony's hospitals in Denver and the Sanatorium of the Jewish Consumptives' Relief Society in Spivak; died in a local hospital September 13, aged 78, of heart disease.

Edward Daland Lovejoy, Salem, Mass.; University of Pennsylvania Department of Medicine, Philadelphia, 1904; served as clinical professor of medicine (dermatology) at the University of Southern California School of Medicine and professor of clinical dermatology at the College of Medical Evangelists, both in Los Angeles; died March 24, aged 70, of carcinoma of the lungs.

Joseph Lutkiewicz, Chelsea, Mass.; Middlesex College of Medicine and Surgery, Cambridge, 1929; died July 16, aged 58, of pulmonary tuberculosis.

Michael Joseph McIntee, Holyoke, Mass.; Columbian University Medical Department, Washington, D. C., 1899; died in Northampton April 22, aged 78, of generalized arteriosclerosis.

Alice Woodby McKane, Boston; Woman's Medical College of Pennsylvania, Philadelphia, 1892; died March 6, aged 83, of arteriosclerosis.

Lena Augusta Geraldson Miller ✠ Napa, Calif.; Cooper Medical College, San Francisco, 1903; for many years affiliated with the Napa State Hospital in Imola; died August 14, aged 72, of coronary thrombosis.

Thomas Francis O'Brien ✠ Worcester, Mass.; Harvard Medical School, Boston, 1921; member of the New England Obstetrical and Gynecological Society; fellow of the American College of Surgeons; on the staffs of the Worcester City and St. Vincent hospitals; consulting obstetrician, Harrington Memorial Hospital, Southbridge, and the Webster District Hospital in Webster; died September 16, aged 51, of coronary thrombosis.

Herbert G. Perry ✠ Louisburg, N. C.; College of Physicians and Surgeons, Baltimore, 1915; served as chairman of the county board of education and member of the county board of health; past president of the Franklin County Medical Society; owned the Louisburg Hospital; died in September, aged 57, of heart disease.

Albie Warren Sylvester, Pittsfield, Mass.; Medical School of Maine, Portland, 1892; member of the American Medical Association; died June 20, aged 83, of cerebral hemorrhage.

Luella Stone Swauger ✠ Oakland, Calif.; California Medical College, San Francisco, 1892; died September 15, aged 74, of cerebral hemorrhage and hypertension.

John Webb Vaughn, Bergey, Pa.; Medico-Chirurgical College of Philadelphia, 1895; served during World War I; formerly member of the Pennsylvania Boxing Commission; president of the medical staff of the Elm Terrace Hospital, Lansdale; died September 24, aged 72.

Claud Earnest Watson, Dallas, Texas; University of Texas School of Medicine, Galveston, 1919; member of the American Medical Association; at one time assistant city health officer and an instructor of psychology at his alma mater; died in St. Paul's Hospital July 21, aged 55, following an operation for gallstones and obstruction of the bowels.

Isabel Gray Weston, Wellesley, Mass.; Boston University School of Medicine, 1887; died in Natick, July 19, of a fractured right femur.

Thomas Spaulding Williams, Dallas, Texas; Southern Methodist University Medical Department, Dallas, 1912; member of the American Medical Association; during World War I served overseas in the British army; an assistant surgeon in the U. S. Public Health Service; member of the staffs of the city board of health, St. Paul Hospital and Methodist Hospital, where he died July 18, aged 55, of coronary occlusion.

LIEUT. JOSEPH L. HALL
M. C., A. U. S., 1913-1944

LIEUT. COL. GEORGE T. COLVARD
M. C., A. U. S. (N. G.), 1896-1944

LIEUT. EDWARD F. RITTER JR.
(MC), U. S. N., 1909-1944

Arthur James Joseph Sullivan, Fall River, Mass.; Jefferson Medical College of Philadelphia, 1912; member of the American Medical Association; died August 6, aged 57, of myocarditis.

KILLED IN ACTION

Joseph Leslie Hall, Stanton, Texas; University of Texas School of Medicine, Galveston, 1938; member of the American Medical Association; interned at the Robert B. Green Memorial Hospital in San Antonio; began active duty as a first lieutenant in the medical corps, Army of the United States, on Sept. 2, 1941; taken prisoner by the Japanese on the fall of Bataan in 1942 and remained in custody of the enemy until his death; awarded posthumously the bronze star medal for meritorious achievement while in a military prison camp in the Philippine Islands; died Oct. 24, 1944, aged 31, 200 miles off the coast of China, when the Japanese ship on which he was a prisoner was sunk by submarine action.

George Todd Colvard ✠ Deming, N. M.; Medical College of Virginia, Richmond, 1924; interned at City Home Hospital, Richmond, Va., and St. Francis Hospital in Jersey City; past president of the New Mexico Medical Society and the president of the Luna County Medical Society; served as a county health officer; chairman of the board of the Carrie Tingley Hospital for Crippled Children in Hot Springs; surgeon for the Santa Fe Railway and the Southern Pacific Railway; began active duty as a major in the National Guard, 200th Coast Artillery (AA) in 1941; later promoted to lieutenant colonel; awarded the Bronze Star Medal posthumously; his unit received two citations in its withdrawal to Bataan; killed at Mindanao, P. I., when a Japanese freighter loaded with American prisoners of war was sunk by an American submarine Sept. 7, 1944, aged 49.

Edward Francis Ritter Jr., ✠ Passed Assistant Surgeon, Lieutenant, U. S. Navy, Mattoon, Ill.; Northwestern University Medical School, Chicago, 1938; interned at the Jersey City Hospital in Jersey City; served a residency in ophthalmology at the Passavant Memorial Hospital in Chicago; entered the U. S. Navy in March 1939 and was stationed at the Naval Hospital in Brooklyn; later sent to the Philippines, where he was a prisoner of the Japanese; killed in action in the Asiatic area Oct. 24, 1944, aged 35.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 23, 1946.

The Need for Creating a Profession of Child Care

In a communication to the *Times* James Young, professor of obstetrics at the British Postgraduate Medical School, refers to the report of the chief medical officer of the Ministry of Health, which shows that during the war years there was a definite fall in the stillbirth rate and a considerable decrease in the deaths of the newborn. This he attributes chiefly to the better average nutrition of mothers resulting from higher wage levels, rationing and food priorities and supplements ordained under the food control system. Healthier mothers produced healthier babies despite factors operating against family stability, such as women's wholesale entrance into industry and damage from bombing. In the postwar years, with the risk of lowered economic standards and shortage in foods essential to expectant mothers, especially milk, Professor Young holds that it is the duty of the administration to maintain the highest possible level of food priorities and supplements. But this is not enough. We require a higher standard of child care. In countries more enlightened in child welfare, such as New Zealand and the Netherlands, personnel are specially trained for such home duties. In these countries the standard of mothercraft is much higher and the wastage of infant life is much lower than in our own. The minister of education recently stated that never in the history of education had there been such an overwhelming demand from all types of people for help in running the home. Professor Young thinks that the time is ripe for the creation of a profession of child care in its various grades—child nurses for private and public nurseries and institutions, teachers and administrators in child care. The professions of medicine, teaching and sick nursing have each their standards of training and diplomas. There are colleges, centrally controlled and state aided, for domestic science; but, for the women who wish to learn the greatest of all domestic sciences and arts, those relating to child care, facilities and encouragement do not exist.

Department of Medical Photography at Hospital

A new departure has been made by the Westminster Hospital, which has established a department of medical photography under the full time charge of a physician. One part of the work is to help in clinical investigation by enabling the staff to keep permanent visual records and to compare serial studies. It also helps in the teaching of students. Thus a film on inflammation has been made and other films are in preparation. For tutorial teaching photographic displays, for example one on gout, are arranged, and the film strip replaces the lantern slide. With a projector, pictures of any magnification which the light allows are reproduced on a screen.

The Centenary of the Discovery of Anesthesia

The centenary of the discovery of anesthesia is being celebrated. At the Wellcome Historical Museum there was an exhibition arranged in an instructive way by means of originals, reconstructions, models, photographs, diagrams and a large number of books. One show case illustrated the knowledge of narcotic and stimulating drugs in primitive times and among the Greeks and Romans, another the days of surgery without anesthesia; others the therapeutic uses of vapors and gases and ether frolics, inhalation anesthesia and nitrous oxide anesthesia.

The director of the museum, Dr. Ashworth Underwood, presided at a meeting in which Lord Moran, president of the Royal College of Physicians, delivered an address. He said that for ages people had tried to produce something which would permit operations being done without pain, but not until the nineteenth century was this achieved. It was left to Wells and Morton to bring it about. Wells apparently did everything necessary, but Morton had to put it across. Anesthesia was no accident but part of a great crusade. He looked with profound satisfaction on the fact that the democracies of Britain and America had taken the chief share in this humanizing process.

On the same day a meeting of the History of Medicine Section of the Royal Society of Medicine was held. Professor Charles Singer, medical historian, presided. He said that it was an error to suppose that before 1846 operations were always performed on the fully conscious. Narcotics and analgesics were known early. They were mentioned in Egyptian writings and in the hippocratic collection. They were mainly of the natural order Solanaceae. In the middle ages the main narcotics were opium, mandrake or belladonna, chiefly the leaves, and hyoscyamus or henbane. Hypnotism was first used in surgical operations by John Elliotson (1791-1862).

CHILE

(From Our Regular Correspondent)

Oct. 1, 1946.

Meeting of Radiologists

The Sociedad de Radiología of Chile, which was established in 1943, held a meeting in Santiago de Chile, September 15 to 17. From now on a meeting will be held each year. The society met in 1944 and 1945 in Santiago, Valparaiso and Concepción. The 1946 meeting was of unusual importance, and there was a large attendance. The official topic was the x-ray diagnosis of pulmonary diseases, and that of the first session was bronchiectasis, pulmonary abscess and silicosis. Drs. F. Daza and A. Toledo, head and assistant head respectively of the Department of Radiology of the Hospital Salvador, and Drs. W. Koch and E. Bellolio were official speakers. Dr. Daza spoke on x-ray semeiology, pathogenesis and anatomic interpretation of bronchiectasis. Dr. Toledo spoke on the differential x-ray diagnosis of circumscribed pulmonary suppuration either of long duration or shortened by the treatment. Drs. W. Koch and E. Bellolio spoke on radiologic diagnosis of pulmonary silicosis. The incidence of industrial silicosis is very high in Chilean industrial centers. In the afternoon Dr. O. Riedel, head of the Institute of Radiology of the San Francisco de Borja Hospital, spoke on the nomenclature of pulmonary diseases. The terminology for designating the different pulmonary lesions encountered during x-ray examination should be unified for a better coordination of studies and results. The speaker described the images he has observed most frequently in pulmonary tuberculosis. Dr. S. Calderón, head of the x-ray department of the National Department for Medical Care of Employees, discussed various aspects of the establishment of a department of preventive medicine. Dr. J. Gundelach, head of the x-ray Department of the Hospital de Tisiología, discussed the organization of a hospital for patients with tuberculosis. The third session was divided into two subsections. Dr. M. Riera, assistant of the Institute Heegewaldt, spoke on x-ray diagnosis of acute pulmonary diseases, based on x-ray observations in cases of lobar pneumonia. The favorable effect of modern chemical therapy is shown in the x-ray images of patients with lobar pneumonia in the course of the treatment. Dr. C. Velasco, assistant in the department of radiology of the Hospital Militar of Chile, spoke on x-ray diagnosis of virus pneumonia. The second subsection was held in association with the Sociedad Chilena de Gastroenterología. Dr. Fernán Díaz, assistant of the Instituto Heegewaldt, spoke on early x-ray diagnosis of gastric cancer, with special reference to cases simulating ulcer. At the closing session on September 17 Dr. L. Guzmán spoke on general indications for roentgen therapy and curietherapy. Other speakers were Dr. L. Opazo, professor of radiology of the Universidad Central, A. Larraguibel, dean of the Faculty of Medicine of the Universidad Central and Dr. R. Salas Pereira, president of the Sociedad Chilena de Radiología.

Correspondence

ARMY MEDICAL LIBRARY

To the Editor:—This is an earnest plea to all American physicians to support to the utmost the development of the Army Medical Library. Serving the profession in a more important way than any other single institution, this great library needs the personal interest and backing of all American physicians if it is to continue to maintain its activities in the manner expected of it. It is particularly important that American physicians support the effort of the Army Medical Library to acquire the permanent fireproof library building necessary to house its great treasures. Plans for such a building are in process, and a location for the new building has wisely been provided near the Library of Congress in Washington. This will assure maximum efficiency in the future development and use of the Army Medical Library for the benefit of the medical profession. It is important that individual physicians inform their representatives and senators of the importance of providing a safe and proper housing for the greatest medical library in the world.

Physicians are learning generally through hard experience that the successful practice of medicine requires continual study. The Army Medical Library is perhaps the single greatest factor in the United States in maintaining the standard of medical education, both for undergraduates and for postgraduates. It sets the standards for all medical libraries, whether established in medical schools, research institutions, county societies or academies. These libraries are the keynote to the entire medical educational effort. They all rely continually on the services of the Army Medical Library. This service can be extended to the mutual advantage of all concerned, through the enlightened interest and support of physicians and medical students. It is fortunate that the American Medical Association works so closely with the Army Medical Library. This cooperation makes possible the publication of the QUARTERLY CUMULATIVE INDEX and also of the great *Index Catalogue*. These are the necessary tools for the utilization of the tremendous body of medical literature now available for the student.

The Army Medical Library serves truly as a national medical library. However, it serves equally truly as a world medical library. The extent of its influence is clearly indicated by a recent English editorial (*Lancet* **2**:168 [Aug. 3] 1946). This editorial welcomed the receipt of the recent volumes of the *Index Catalogue*, so that English physicians may again have an opportunity to keep abreast of world literature in medicine. The editorial commented on the fact that the *Index Catalogue*, established by Dr. John S. Billings, is now in its fifty-sixth volume. It points out that 80 per cent of the issues are given freely to medical libraries in all parts of the world. The editorial goes on to comment on the wise guidance of Col. Harold W. Jones in maintaining the high quality of the *Index Catalogue*.

It may be possible for the Army Medical Library to extend its usefulness by establishing sublibraries in strategic parts of the country, such as on the West Coast, in the Middle West and in the South. Such sublibraries could contain microfilms of important periodical sets, together with duplicate material. Fortunately, medical libraries anywhere can continue to obtain assistance from the Army Medical Library in microfilms of otherwise inaccessible material. This service was one of the most important professional aids to our wideflung medical officers during the war.

It is necessary for the Army Medical Library to have ample funds for maintenance of its services and to be assured of the permanent fireproof building needed to house its great treasures. This building may become a center for basic research in all the health sciences. In order to obtain these funds it is essential that physicians generally show their representatives in Congress that they appreciate and need the continued service of the Army Medical Library. As William H. Welch indicated, the Army Medical Library still remains the greatest contribution of this country to medicine.

CHAUNCEY D. LEAKE, M.D., Galveston, Texas.
Vice President, University of Texas.

REACTION TO PENICILLIN

To the Editor:—In view of the good results that have been reported during the last eighteen months in the use of penicillin aerosol treatments for asthma due to bacterial allergy, I would like to report a very severe reaction to penicillin by an asthmatic patient.

The patient received treatments of an hour each for three successive days during one week and this was repeated again the next week. Penicillin, 40,000 units per cubic centimeter, was used and the aerosol technic was employed. Following the third treatment in the second week the patient, who had been suffering from asthma for fifteen years, went into status asthmaticus, which was very difficult to control. Nothing like this had occurred to this patient before. The attack was much worse than any which he had ever experienced.

It would seem important that controlled research should be undertaken on methods to avoid such reactions in asthmatic patients.

FRANKLIN E. BISSELL, M.D., Los Angeles.

POLIOMYELITIS VIRUS IN SEWAGE

To the Editor:—In the editorial comment on poliomyelitis virus in sewage (THE JOURNAL, September 7) the statement is made that "Kling's theory was presumably based on experimental or statistical errors." Kling's work was done on poliomyelitis organisms occurring in Stockholm sewage. The American investigators used American sewage and a mixture of laboratory strains of the organisms and did not obtain the same results as Kling. Is it fair to conclude therefore that Kling's theory was based on errors, either experimental or statistical, considering the possible differences in the sewage and the strains of the organisms? Would not the penultimate sentence have been a more scientific as well as a more courteous conclusion?

JOSEPHINE EVARTS, M.D., Kent, Conn.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Nov. 16, page 668.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Part II.* Dec. 16-17. *Part III.* Boston, Chicago, Jan. 9-11. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia 2.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral.* Los Angeles, 2d week in April. Sec., Dr. P. M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY & SYPHILOLOGY: *Oral.* Cleveland, Dec. 5-7. Sec., Dr. George M. Lewis, 66 E. 66th St., New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* March 17. Asst. Sec., Dr. W. A. Werrell, 1 W. Main St., Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY. Applications for examination will be accepted until Feb. 15. Sec., Dr. P. C. Bucy, 912 S. Wood St., Chicago.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral. All Groups. Parts I and II.* New York, June 1947. Final date for filing application is Dec. 1. Chicago, October 1947. Final date for filing application is March 1. Sec., Dr. S. J. Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF OTOLARYNGOLOGY: St. Louis, April 16-19. Sec., Dr. D. M. Lierle, University Hospitals, Iowa City, Ia.

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D.D.N.J. and foods, F.N.J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment.]

Adelorine.—John I. Wean, Eustis, Fla. Shipped Oct. 15, 1942. Composition: essentially oils of mustard and thyme, and a low-boiling petroleum oil. Misbranded because label falsely represented it as an effective remedy for sore muscles and joints from strain or overwork, for sprains, bruises, itching and nasal irritations. Further misbranded because label did not bear common or usual name of each active ingredient, since the composition was given in Latin rather than in English.—[*D. D. N. J., F. D. C. 994; November 1944.*]

Booth's Balm.—Booth's Hyomei Company, Ithaca, N. Y. Shipped April 16, 1942, by Dobson & Company, Nashville, Tenn., and Rutherfordton, N. C. Composition: plant extractives, particularly chlorophyll, as well as a cresol-like substance and a trace of eucalyptol, in a base of petrolatum and fatty material. Misbranded because label falsely represented product as effective in preventing or curing dandruff, pimples, blackheads, eczema and itching skin, besides benefiting bronchial catarrh, head colds, spasmodic croup, aching feet, tender breasts and sore nipples.—[*D. D. N. J., F. D. C. 1011; March 1945.*]

B. P. Stomach and Intestinal Corrective.—Burwell & Dunn Company, Charlotte, N. C. Shipped April 16, 1942, by Dobson & Company, Nashville, Tenn., and Rutherfordton, N. C. Composition: essentially bismuth subsalicylate, sugar and water, with a small amount of volatile oils, including peppermint. Misbranded because label falsely represented product to be efficacious for stomach fermentation, vomiting, diarrhea, cholera morbus and some other disorders in children and adults.—[*D. D. N. J., F. D. C. 1011; March 1945.*]

Chu-man-ie's Regular "Triple XXX" Herb and Iron Mensal Medicine.—Charles Roehm, trading as Chumanie Medicine Company, New Richmond, Ohio, and Detroit. Shipped Jan. 12, 1942. Composition: tablets containing ferrous sulfate and plant material, including aloe. Misbranded because labeling falsely represented product to be efficacious for amenorrhea, oligomenorrhea and dysmenorrhea and failed to warn that the product, as a laxative, should not be used continuously.—[*D. D. N. J., F. D. C. 1007; March 1945.*]

Dr. Wolff's Pro-cys-kera Ointment.—Dr. George F. Wolff, Chicago. Shipped Sept. 3, 1942. Composition: essentially sulfur, salicylic acid, menthol, camphor and ichthammol, in a base of saponifiable fat, lecithin and cholesterin. Misbranded because label falsely represented that product would eradicate scalp disorders and nourish, strengthen and promote the growth of hair, penetrate the scalp and prevent infection.—[*D. D. N. J., F. D. C. 992; November 1944.*]

Ekzebrol.—E. Tosse and Company, Brooklyn. Shipped Oct. 23, 1942. Label declared: "Ekzebrol 10% Strontium Bromide in Sterile Saline Solution For Intravenous Injection." Misbranded because of false label representations regarding alleged virtues of strontium bromide and also concerning alleged effectiveness of Ekzebrol in skin diseases.—[*D. D. N. J., F. D. C. 995; November 1944.*]

Fem-Re-Ills.—Henry S. Wampole Company, Baltimore. Shipped April 16, 1942, by Dobson & Company, Nashville, Tenn., and Rutherfordton, N. C. Composition: pills chiefly containing ferrous sulfate, calcium carbonate, oil of savin, sugar, and plant extractives, including aloes, and small amounts of ergot alkaloids. Misbranded because labeling falsely represented that product would correct various menstrual disorders.—[*D. D. N. J., F. D. C. 1011; March 1945.*]

Fero-Tona.—Great Lakes Laboratories, Cleveland; Ber-Mel, Inc., Cleveland, distributors. Shipped May 25 and Nov. 6, 1942, and Jan. 2, 1943. Composition: essentially hexamethylenamine, potassium iodide, ferric chloride, laxative plant drugs and strychnine sulfate. Misbranded because, among other things, label lacked warning against taking a laxative continuously or when symptoms of appendicitis are present, administering a strychnine mixture to children or elderly persons, or one containing potassium iodide to those having goiter, except on advice of a physician.—[*D. D. N. J., F. D. C. 1003; March 1945.*]

Formula "U."—Universal Antiseptic & Research Laboratories, Inc., Bristol, Tenn. Shipped Sept. 5, 1942. Composition: essentially water, carbolic acid, sugars, thymol, sage, alum, borates and aromatic substances. Misbranded because labeling falsely represented product as an adequate treatment for major burns, varicose ulcers and infected gums.—[*D. D. N. J., F. D. C. 993; November 1944.*] Possibly this is a later name for a product of essentially the same composition but slightly different name, "Universal Formula," put out by the same concern and declared misbranded under *D. D. N. J. 46*, issued in May 1940. This was abstracted in THE JOURNAL Nov. 2, 1940, page 1567.

Irogen.—Guardian Health Products Company, Inc., Atlanta, Ga. Shipped April 16, 1942, by Dobson & Company, Nashville, Tenn., and Rutherfordton, N. C. Composition: essentially alcohol, an iron salt, malt, cinchona and nux vomica alkaloids, a manganese salt, wild cherry, emodin-bearing drugs, phosphorus compounds, a sodium salt, sugar and water. Misbranded because falsely represented in labeling as efficacious for enriching the blood, building strength, restoring impaired tissues, aiding digestion and restoring tone to the system.—[*D. D. N. J., F. D. C. 1011; March 1945.*]

Jew David's or Hebrew Plaster.—Comstock & Company, Rochester, N. Y. Shipped April 16, 1942, by Dobson & Company, Nashville, Tenn., and Rutherfordton, N. C. Composition: a brown, somewhat plastic mass resembling Burgundy pitch and having a turpentine odor. Misbranded because label falsely represented product as efficacious for treating local inflammation, scrofulous conditions, gout, inflammatory and chronic rheumatism, lung and liver disorders, stomach pains and spinal weaknesses.—[*D. D. N. J., F. D. C. 1011; March 1945.*]

Liver-Cure—Munyon's Homeopathic Home Remedies.—Henry S. Wampole Company, Baltimore. Shipped April 16, 1942, by Dobson & Company, Nashville, Tenn., and Rutherfordton, N. C. Composition: small sugar pellets with nothing else detected. Misbranded because labeling falsely represented that product would be helpful for all liver disorders, as well as biliousness, constipation, bilious and sick headache, and would relieve bad taste in the mouth, coated tongue, worn-out feeling, highly colored urine, soreness in the right side, dull spirits and restless nights.—[*D. D. N. J., F. D. C. 1011; March 1945.*]

Nelson's Antacid Powder.—Great Lakes Laboratories, Cleveland. Shipped May 25 and Nov. 6, 1942, and Jan. 2, 1943. Composition: essentially compounds of sodium, calcium and magnesium, including carbonate. Misbranded because label falsely represented that, among other things, product offered a rational and effective method of re-establishing the normal alkalinity of the body fluids without the danger of systemic disturbance, instantly neutralized all stomach acids, and gave prompt relief from acidity and gas pressure.—[*D. D. N. J., F. D. C. 1003; March 1945.*]

Rheumatic No. 3 Tablets.—Charles Killgore Company, Inc., Yonkers, N. Y. Shipped Sept. 8 and Dec. 1 and 4, 1941. Adulterated and misbranded because strength differed from and quality fell below what was represented, namely, that each tablet contained 7½ grains of sodium salicylate, whereas not more than 6.18 grains of this was found.—[*D. D. N. J., F. D. C. 1012; March 1945.*]

Sani-Caps.—Sani-Caps, Rock Island, Ill. Shipped Nov. 12, 1942. Composition: essentially glycerin and boric acid with small amounts of iodide and a silver compound. Misbranded because label falsely represented product as being efficacious for "female trouble," even in cases of long standing. Further misbranded because represented to prevent infection. Misbranded also because label did not give names of active ingredients or name and place of business of manufacturer, packer or distributor.—[*D. D. N. J., F. D. C. 987; November 1944.*]

Targosine.—Targosine Company, Monroe, N. C. Shipped April 16, 1942, by Dobson & Company, Nashville, Tenn., and Rutherfordton, N. C. Composition: essentially turpentine, kerosene, fatty material, a water-soluble gum and water, with a small amount of chloroform. Misbranded because falsely represented as efficacious for eczema, rheumatic pains, croup, tonsillitis, vaccination sores and some other disorders.—[*D. D. N. J., F. D. C. 1011; March 1945.*]

Thompson's Daily Vitamin and Mineral Ration.—William T. Thompson Company, Los Angeles. Shipped Oct. 12, 15 and 20, 1942. Composition according to label: vitamins A, B_1, B_6, C, D and G, niacin amide, pantothenic acid, biotin, calcium, phosphorus, iodine, iron and copper. Misbranded because falsely represented, among other things, to improve appetite and digestion, build nervous stability, prevent impaired eyesight due to vitamin deficiencies, build up the blood count, prevent dental cavities and bleeding gums, reduce colds, cut down fatigue, and do some other things.—[*D. D. N. J., F. D. C. 997; November 1944.*] Further misbranded under provisions of the law applicable to foods, as reported in *F. N. J. 5787.*

Triple-X Medicine.—Triple X Laboratories, Scotland Neck, N. C. Shipped April 16, 1942, by Dobson & Company, Nashville, Tenn., and Rutherfordton, N. C. Composition: copaiba and cubeb oils and a sugar solution, emulsified with a water-soluble gum. Misbranded because label falsely represented that product would prevent or cure acute and chronic discharges, and because label did not bear common or usual name of each active ingredient.—[*D. D. N. J., F. D. C. 1011; March 1945.*]

Viteen.—L. N. LeBold & Company, Rochester, N. Y. Shipped between Aug. 15 and Oct. 27, 1942. Composition: chiefly dried skimmed milk, with smaller amounts of egg yolk, sugar, cereal products, calcium and phosphorus compounds, and flavoring material. Misbranded because of label representations as to protein and mineral content and as to suitability as a weight reducer and a supplement to restricted and unbalanced diets.—[*D. D. N. J., F. D. C. 990; November 1944.*] Also misbranded under provisions of the law applicable to foods, as reported in *F. N. J. 5786.*

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Liability of Physician for Departing from Approved Methods. — The plaintiff sued for damages for injuries resulting from the alleged negligence of the defendant in the treatment of a fracture. From a judgment for the plaintiff, the defendant appealed to the Supreme Court of North Carolina.

The plaintiff fractured one of the bones in her right forearm and engaged the defendant physician to treat her. He set the bone and put the arm and wrist on a board splint. Later he removed the board splint and substituted a metal cast, at the same time massaging the plaintiff's arm and hand. The defendant subsequently visited the plaintiff once or twice a week, the plaintiff testifying:

> Each time he came he brought a tube or something and massaged my arm. He would take my arm out of the cast and massage it. He would not support the broken part of my arm while he was massaging it. . . . He held it with the fingers in one hand and rubbed my arm and hand with his other hand.

After about three months the plaintiff's hand was so drawn and bent that she could not use it, and the defendant took her to another physician who examined her arm and took an x-ray. He found the bone out of position and testified that the displacement could have occurred when the physician removed the arm from the splint. The plaintiff introduced expert evidence to the effect that the manner in which the defendant massaged the plaintiff's arm "was unusual" and not according to the general practice, and that "too frequent removal of a broken bone from the cast is bad practice . . ."

The Supreme Court said that a departure from approved methods in general use, if injurious to the patient, suffices to carry the case to the jury on the issue of negligence. On the basis of all the evidence the court was of the opinion that the removal of the cast once or twice a week and the massaging of the plaintiff's arm and hand without any support under the broken part was unusual and a departure from approved methods in general use. The jury was warranted, concluded the court, in finding that such conduct was injurious, so the judgment for the plaintiff was accordingly affirmed.—*Davis v. Wilmerding, 24 S. E. (2d) 337 (N. C., 1943).*

Privileged Communications: Physician's Report to Insurer.—Plaintiff obtained an award for an industrial injury, the award being against the defendant insurance company. Subsequently the insurance carrier filed a motion to reopen the case and discontinue payments on the award. Attached to this motion was a physician's report as required by the workmen's compensation act. On the theory that this report was libelous, the plaintiff filed suit for damages against the insurance company and obtained judgment in the trial court, from which judgment the defendant appealed to the Supreme Court of Oklahoma.

The physician's report, in the form of a letter addressed to the manager for the insurance carrier, stated among other things that in his opinion the plaintiff exaggerated his condition and appeared to be in good health, suffering from no disability and able to do light work. The report then contained this paragraph:

> This patient has had a positive Wasserman test on two previous occasions, a positive Wasserman test was obtained during my treatment. He was given several shots of Mapharsen and seemed to improve, but he absolutely refused further Leutic treatment because it made him sick. He flatly refused to have a spinal puncture done to determine his Wasserman reaction and colloidal curves for Lues.

The plaintiff contended that the statement was libelous and was not relevant and pertinent to the issue involved in the proceeding to discontinue compensation, whereas the defendant contended that the statement was absolutely privileged.

The Oklahoma statute (12 O. S. 1941 section 1443) provides:

> A privileged publication or communication is one made: First. In any legislative or judicial proceeding or any other proceeding authorized by law; . . . No publication which, under this section, would be privileged, shall be punishable as libel.

Furthermore, rule 17 of the state industrial commission provides:

> The Commission will not consider nor set for hearing any motion to discontinue payment of compensation ordered . . . unless such motion to discontinue compensation sets up sufficient grounds supported by a physician's report.

It is clear, said the Supreme Court, that a proceeding before the state industrial commission is a "proceeding authorized by law" within the purview of section 1443. It is also clear that it is proper and necessary to file a physician's report with a motion to discontinue compensation under rule 17. Bearing in mind the foregoing rules, we are of the opinion, and hold, said the court, that the statement here complained of was pertinent to the question raised by the motion to discontinue compensation. The motion contained the allegation that the claimant "is able to return to ordinary manual labor and is entitled to no further compensation" by reason of the injury. The physician's report tended to sustain such allegation. If the disability was due entirely to syphilis, the court continued, the insurance carrier was not liable for further compensation. And, since the matter complained of was filed as a part of the pleading in the case, the question as to whether the matter was pertinent or relevant was one for the court to determine as a matter of law and not one to be submitted to the jury. The court accordingly concluded that the matter complained of was absolutely privileged, that a question of its being false or made with malice was immaterial, and the judgment in favor of the plaintiff be reversed.—*Pacific Employers Insurance Company v. Adams, 168 P. (2d) 105 (Okla., 1946).*

Medical Motion Pictures

FILM REVIEW

Hemostasis with Oxidized Cellulose (Absorbable Gauze and Cotton). Prepared in 1946 by Virginia Kneeland Frantz, M.D. 16 mm., color, silent, 850 feet (one reel). Showing time, thirty-five minutes. Investigation carried out at Columbia-Presbyterian Medical Center under OSRD Contract. Procurable on loan from the author at Department of Surgery, Columbia University College of Physicians and Surgeons, 630 West 168th Street, New York 32.

This film presents an experimental and clinical study of the new hemostatic agent oxidized cellulose. The color photography is excellent. The film begins with the presentation of the chemistry and physical properties of oxidized cellulose as well as its biologic properties when the oxidized cellulose comes in contact with blood. Tests of the absorptive properties of the oxidized cellulose are demonstrated in experiments on rats, and the hemostatic properties are demonstrated in experimental operations on dogs, in which incisions are made in the kidney and the spleen. The film then presents clinical data on the use of oxidized cellulose in operations for brain tumor, in which oxidized cotton is used to control bleeding from the dura, and oxidized gauze is used to control bleeding from the bone flap.

In another clinical case in which a biopsy of the kidney is performed, the use of the oxidized gauze is demonstrated. In a suprapubic prostatectomy the oxidized gauze is used for controlling the bleeding from the prostatic bed. In a case of chronic varicose ulcer in which deep incision is made into the scar tissue about the ulcer, the oxidized gauze is used as an aid in controlling bleeding. This particular case illustrates one interesting feature of the oxidized cellulose in that it can be subsequently peeled away from the raw surface after three days without any evidence of adherence of the gauze to the raw surface of the wound and thus without causing any further bleeding.

This film is of value to the surgeon to give a better understanding of the properties of oxidized cellulose and the technic of application to obtain hemostasis. It would be a suitable film for surgeons and for resident staff personnel.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1936 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

16:413-476 (July) 1946

Relation of Urea Nitrogen to Nonprotein Nitrogen of Blood: I. Antemortem Data on Whole Blood. R. Dominguez, Elizabeth Pomerene and Elinor M. Zorn.—p. 413.
Liver Function Tests. L. J. Wade.—p. 426.
Simplified Test for Fragility of Erythrocytes. R. Straus and Renee Faigin.—p. 437.
Composition of Seitz Filter Pads. H. B. Webb.—p. 443.
Microtechnic of Pathologic Eye: III. Orientation and Division of Eyeball. G. E. Lathrop.—p. 448.
Blood Cell Counts and Hemoglobin Value in Normal and Diabetic Dogs. E. Marie Smith.—p. 457.
Arteriovenous Fistula Involving Aorta and Superior Vena Cava: Report of Case. J. W. Walker and V. J. Dardinski.—p. 462.
Sacral Spina Bifida, Intrapelvic Meningocele and Sacrococcygeal Teratoma: Report of Case. C. M. Alexander and L. D. Stevenson.—p. 466.

American J. Digestive Diseases, Fort Wayne, Ind.

13:245-274 (Aug.) 1946

*Some Effects of Gum Chewing on Gastric Acidity in Healthy Individuals. C. S. Smith, Helen L. Wikoff and Martha E. Southard.—p. 245.
Tyrothricin in Proctology. A. J. Cantor.—p. 247.
Radiation Therapy of Cancer of Esophagus. J. Borak.—p. 249.
*Continuous Drip Treatment for Chronic Ulcerative Colitis: Preliminary Report. J. Nasio.—p. 252.
Brief Psychotherapy in Treatment of Gastrointestinal Disorders. M. L. Hayward.—p. 255.
Gastrointestinal Symptomatology in Schizophrenia. J. M. Schenck.—p. 257.
Peptic Ulcer: Roentgenologic, Laboratory and Clinical Follow-Up of 200 Peptic Ulcers. A. J. Delario.—p. 260.

Gum Chewing and Gastric Acidity.—Twelve healthy persons without apparent gastric disturbances who had served as subjects for several gastric analyses in a previous investigation were used for this study. After the standard test meal of crackers and water each subject chewed 2 Gm. of a chewing gum (composed of chicle flavored with oil of peppermint) for a period of five minutes. It was found that the chewing of gum depressed the gastric acidity of two thirds of the subjects during the period of an hour. Both the total and the free acidity were depressed in five sixths of the subjects for the first half hour. The maximum total acidity was less in 11 of the 12 subjects when gum was chewed. The time required to reach this maximum did not vary materially from the time required when no gum was chewed.

Continuous Drip Treatment for Chronic Ulcerative Colitis.—Nasio treats patients with ulcerative colitis by administering a colloidal preparation similar in mechanical properties to the normal secretion of the intestinal mucosa. He attaches a latex tube to a continuous drip apparatus and introduces it through the nose as far as the cardia. A 1:2 or 1:3 suspension of kaolin in alumina gel with liquid petrolatum 500 Gm., to which has been added bismuth subgallate 50 Gm., is placed in the drip apparatus. Seven hundred Gm. of the mixture usually is administered in twenty-four hours, although more may be given with safety. Sulfaguanidine or succinylsulfathiazole and any antispasmodic remedy, as 10 per cent paregoric, also may be added if desired. The drip is permitted to flow at the rate of 10 drops per minute the first day, later increased to 20 drops per minute as tolerated by the patient. The drip is discontinued for half an hour before and after breakfast and the midafternoon feeding, and for one hour before and two hours after lunch and dinner. During these intervals the patient may be permitted out of bed. Treatment is continued for periods of fifteen days, with rest intervals of not less than a month, and is repeated as necessary. Six cases of serious chronic ulcerative colitis are described, in which symptomatic relief occurred in eighteen to forty-eight hours after drip treatment was begun, with progressive clinical, roentgenographic and rectosigmoidoscopic evidence of improvement. In 2 cases a remission necessitated further drip treatment.

American J. Obstetrics and Gynecology, St. Louis

41:179-348 (Aug.) 1946. **Partial Index**

Prevention and Treatment of Carcinoma of Vulva. B. P. Watson and S. B. Gusberg.—p. 179.
*Aspiration of Stomach Contents into Lungs During Obstetric Anesthesia. C. L. Mendelson.—p. 191.
Muscle of Micturition: Its Role in Sphincter Mechanism with Reference to Incontinence in Female. W. T. Kennedy.—p. 206.
Total Abdominal Hysterectomy: Study of 500 Cases. W. C. Danforth.—p. 218.
Manchester Operation, with Special Reference to Parturition and Complete Prolapse: Report of 206 Cases. C. A. Gordon.—p. 228.
Evaluation of Extraperitoneal Cesarean Section. S. A. Cosgrove and E. G. Waters.—p. 237.
Discussion of Pelvic Variation and Report on Findings in 100 Negro Women. H. Thoms.—p. 248.
Value and Limitations of Pelvioradiography in Management of Dystocia, with Special Reference to Midpelvic Capacity. A. Weinberg and S. J. Scadron.—p. 255.
*Heart Disease in Pregnancy. W. B. Stromme and Katherine Kuder.—p. 264.
Veratrum Viride in Treatment of Toxemias of Pregnancy. J. R. Willson.—p. 273.
Treatment with Massive Arsenotherapy of Early Syphilis Complicated by Pregnancy. A. C. Curtis and G. Morrow.—p. 284.
Critical Study of 390 Major Gynecologic Surgical Procedures. C. M. Malone.—p. 291.
Successful Treatment of Hydramnios with Ammonium Chloride: Preliminary Report. A. A. Abrams and S. B. Abrams.—p. 299.
Extrauterine Pregnancy. A. H. Dindia and V. J. Turcotte.—p. 321.
Spontaneous Rupture of Liver in Eclampsia with Fatal Hemoperitoneum. S. Sanes and C. A. Kaminski.—p. 325.

Aspiration of Stomach Contents into Lungs During Obstetric Anesthesia.—Mendelson says that there have been 66 instances of aspiration of stomach contents into the lungs in 44,016 pregnancies, an incidence of 0.15 per cent. Two entirely different syndromes may follow aspiration. Aspiration of solid food usually produces laryngeal or bronchial obstruction. Complete obstruction produces suffocation. Incomplete obstruction produces massive atelectasis with cyanosis, tachycardia, dyspnea, mediastinal shift and signs of consolidation over the collapsed area. Obstruction should be promptly relieved either indirectly by external stimulation, with encouragement of coughing, or directly with the aid of suction and endoscopic removal. Aspiration of liquid material produces an asthma-like syndrome. There are cyanosis, tachycardia and dyspnea but no mediastinal shift or massive atelectasis. Wheezes, rales and ronchi are heard. X-rays reveal irregular, soft, mottled densities without mediastinal shift. The picture has been misinterpreted as bronchopneumonia, tuberculosis, fungous infection and even metastasis. Progressive cardiac embarrassment and pulmonary edema may supervene. Animal experiments indicate that hydrochloric acid is responsible for these changes. Treatment should be directed against the bronchiolar spasm and cardiac embarrassment. Oxygen, atropine, epinephrine and aminophylline will accomplish these objectives. Should cardiac failure develop, rapid intravenous digitalization is indicated. The circulatory burden may be relieved by the application of tourniquets to the extremities to produce the effect of a bloodless phlebotomy. Aspiration of stomach contents into the lungs may be avoided by withholding oral feeding during labor, by wider use of local anesthesia when feasible, by alkalization of the stomach contents and emptying the stomach prior to the administration of a general anesthetic, by competent administration of general anesthesia and by adequate delivery room equipment, including transparent anesthetic masks, tiltable delivery table, suction, laryngoscope and bronchoscope.

Heart Disease in Pregnancy.—Stromme and Kuder report 720 cases of heart disease, which represent 3.02 per cent of the 23,858 pregnancies cared for between 1937 and 1944. They stress the importance of hospitalization prior to labor. Special

care must be given to these women in labor. The second stage must be shortened by operative means, particularly in the woman with severe cardiac defects. The authors have noted a trend from cesarean section to forceps deliveries, a greater use of local anesthesia and liberalization in interruption of pregnancies in bad risk cases. These factors explain a lowering of the maternal mortality among cardiac patients from 14.18 to 12.64 per thousand pregnancies. A further lowering of this figure is possible through better cooperation in early registration and through improvement in selection of patients for therapeutic abortion, earlier interruption and sterilization. Infantile mortality is essentially unaffected by maternal heart disease.

American Journal of Surgery, New York

72:145-288 (Aug.) 1946

Conservative Gynecology. A. E. Hertzler.—p. 147.
*Boiled Cartilage Implants. C. Firestone.—p. 153.
Rupture of Lower Lumbar Intervertebral Disks. M. K. King.—p. 161.
Advantages of Gridiron Incision in Treatment of Carbuncles. U. Maes and E. C. Heringman.—p. 166.
*Late Repair of Tendons in Hand. G. V. Webster.—p. 171.
*Splenectomy in Familial Hemolytic Jaundice: Study and Cure of Patient with Normal Erythrocyte Fragility and Other Unusual Features. L. H. Eisendorf and J. R. Broun.—p. 179.
Interstitial Hernia: Review of Literature and Report of 3 Cases. A. M. Dickinson.—p. 186.
Incipient Epiphyseolisthesis of Hip: Its Diagnosis and Treatment. S. Kleinberg.—p. 190.
Carcinoma of Stomach. P. B. Hudson and R. Alt.—p. 202.
Skin Dressings in Treatment of Debrided Wounds. E. C. Gay.—p. 212.
Regional Anesthesia: Its Advantages in Emergency Surgery of Extremities. G. A. P. Hurley.—p. 219.
Pilonidal Cysts: Treatment by Marsupialization Operation. C. Bunch. —p. 229.
Use of Transversus Abdominis in Repair of Indirect Inguinal Hernia. E. F. McLaughlin.—p. 232.
Ultraviolet Blood Irradiation in Biliary Disease: Knott Method. R. C. Olney.—p. 235.
Physiology of Nose and Its Relation to Plastic Surgery. E. S. Lamont. —p. 238.
Hemolytic Streptococcus in Wounds of Rabbits: Action of 5-Nitro-2-Furaldehyde Semicarbazone. E. Neter and T. G. Lamberti.—p. 246.
New Operation for Dislocated Septal Cartilage. R. Kayser.—p. 248.
Method of Pelvic Measurement. D. I. Solomon.—p. 252.
Koroseal: Rubber Substitute. W. L. Green.—p. 254.
Indirect Inguinal Hernia: Repair of Anatomically Weak Area. D. Brezin. —p. 256.
Intra-Abdominal Placement of Drugs: Simple Method. J. T. Colley and R. H. Clifford.—p. 257.

Boiled Cartilage Implants.—Firestone uses cartilage from subjects who have been prepared for burial. The cartilage is vigorously boiled for twenty minutes and then placed in a 50 per cent solution of alcolhol and kept there at room temperature until the need for it arises. At that time pieces of desirable size are removed from the alcohol, washed in tap water, wrapped in gauze and boiled vigorously for twenty minutes in the sterilizer, together with the instruments. The boiling removes all trace of the preservative. They are then brought to the operating room, shaped to fill the particular contour deformity, perforated and implanted in the routine manner. Cartilage from Negro and Japanese subjects were implanted, together with cartilage from Caucasians, into the same Caucasian recipients. Results have been uniformly favorable. Heterocartilage (bovine) is transplantable to man and holds promise of becoming the implant of choice, because of its coefficient of increased reaction in locations where subcutaneous soft tissues require elevation.

Late Repair of Tendons.—Webster points out that primary suture of flexor tendons in the fingers still results in failure at the hands of all but a few experts, and most of these cases result in disabilities which require late plastic repair. If infection has occurred, if foreign bodies have remained in the wound or if multiple surgical procedures have been performed, late tendon repair offers only a fair chance for recovery of function. If fingers have been ruthlessly opened, cutting across flexion creases at right angles and destroying the "pulley" mechanism in the fingers, little hope can be given for restoration of function. Some of these cases can be improved by excision of all volar scar and replacement with a pedicle flap of skin and fat. A hand with flexible joints, intact nerves and good circulation presents the ideal situation for late tendon repair. A final evaluation of results should be deferred for a year to eighteen months. Tendons, like bones, aline their structure in the direction of the stress which is put on them, and often a finger which flexes poorly at three months will be improved at six months and with active exercise it may be moving well six months to a year later. Premature reexploration of a finger that has been operated on may forfeit all chance of final improvement. The author stresses the importance of knowledge of anatomy, of a bloodless field, of carefully planned incisions and of closure of wounds without buried sutures. The cooperation of the patient must be excellent. Good results are frequent, but excellent results are rare.

Splenectomy in Familial Hemolytic Jaundice.—Eisendorf and Broun report a case of congenital hemolytic icterus which was cured by splenectomy. The following unusual features were presented: the fragility of the erythrocytes was normal; microspherulosis was minimal; the liver damage was improved by splenectomy and an unusual postoperative hemolytic crisis resulted with a drop in the erythrocyte count to two and a half million.

American Review of Soviet Medicine, New York

3:481-590 (Aug.) 1946

Repair of Defects and Fistulae in Urinary Bladder. A. P. Frumkin. —p. 484.
*Use of Cellophane in Treatment of Wounds. N. L. Chistyakov.—p. 490.
Fermentation in Pus. L. G. Smirnova and V. N. Tyunina.—p. 494.
Physicochemical Nature of Antibiotic Action. W. A. Dorfman, E. A. Moldavskaya, T. L. Kastorskaya and P. S. Zasypkina.—p. 500.
Bacteriostatic Substances of Animal Origin. A. S. Konikova, A. P. Urasova and R. M. Asarkh.—p. 511.
*Vaccination Against Typhus. M. K. Krontovskaya.—p. 515.
Specific Prophylaxis and Early Diagnosis of Typhus. A. A. Smorodintsev. —p. 522.
*Significance of Basic Argyrophil Substance in Pathogenesis of Hypertension. A. I. Smirnova-Zamkova.—p. 534.
Balneologic Treatment of Chronic Osteomyelitis. V. A. Alexandrov. —p. 539.

Cellophane in Treatment of Wounds.—Chistyakov used cellophane gauze dressing in the treatment of superficial and deep gunshot wounds in their later stages and in open and closed operative wounds. Cellophane is applied directly over the affected part and will not absorb any secretions. The space between the cellophane layer and the wound gradually fills with secretions, which escape at the wound edges, where they are absorbed by the superimposed layer of gauze. The exudate at the bottom and around the edges of the wound underneath the cellophane prevents drying. The retained moisture is highly desirable for normal healing. The protective covering of cellophane keeps the wound at body temperature, which is essential for tissue regeneration. Cellophane does not stick to the surface of the wound and can be easily removed without disturbing normal healing. Subsequent dressings can be performed with little pain or discomfort to the patient. At evacuation points a wound can be examined and observed under the cellophane after the covering gauze dressing has been removed. Cellophane dressings are convenient in skin grafting operations, as they protect the wound from drying and do not disturb the grafted epidermis. No delay in healing nor any complications were observed which could be attributed solely to the cellophane gauze dressings.

Vaccination Against Typhus.—Krontovskaya obtained large quantities of Rickettsia prowazeki from the lungs of white mice by infecting the animals with material obtained from the tunica vaginalis of diseased guinea pigs. The material was instilled intranasally into the mice. For continued passage and for the preparation of vaccine, the lungs of the mice were removed aseptically. An emulsion of the lung tissue containing a great number of extracellular Rickettsia prowazeki was made, isotonic solution of sodium chloride containing 0.2 per cent formaldehyde added and fractional centrifugation done. A suspension of clean, washed-out Rickettsia prowazeki was obtained and diluted according to a standard with isotonic solution of sodium chloride containing 0.2 per cent of formaldehyde. Experiments on guinea pigs and serologic studies on human subjects were made which suggest that the vaccine is

harmless. It causes only mild and general reactions and increases specific antibodies in the serums of vaccinated persons. From statistical material and observation on 200,000 persons among medical personnel and populations in the formerly occupied territories, it appears that the type of typhus developed by vaccinated persons was atypical and abortive, preceded by a long incubation period of twenty-three days, with moderate fever lasting six to seven days. Patients recovered rapidly. The changes following vaccination suggest that the vaccine has a specific antigenic value.

American Review of Tuberculosis, New York

54:1-96 (July) 1946

Apical Tuberculosis: Roentgenologic Technic for Its Early Recognition, with Some Pathogenetic Applications. A. J. Flaxman.—p. 1.
Employment of Ex-Tuberculous Patients. H. S. Willis.—p. 9.
Patients' Information About Tuberculosis: Survey with Standardized Questionnaire. J. Newman.—p. 13.
*Results of Pneumolysis. Henriette Marcus and M. Pinner.—p. 25.
*Vaccination with Vole Bacillus (Wells): Protective Value of Percutaneous and Intracutaneous Vaccination (Observations on Multiple Puncture Vaccination on Man). K. Birkhaug.—p. 41.
R1 Strain of Tubercle Bacillus: Its Dissociation and Virulence of Variants in Normal and Silicotic Guinea Pigs. W. Steenken Jr. and L. U. Gardner.—p. 51.
History of H37 Strain of Tubercle Bacillus. W. Steenken Jr. and L. U. Gardner.—p. 62.
Cultures of Pulmonary Secretions: Their Accuracy in Evaluation of Activity in Pulmonary Tuberculosis. L. L. Sanford.—p. 67.
Plasma and Urinary Ascorbic Acid in Tuberculous Patients. Elizabeth V. Webb, Clara A. Storvick and K. B. Olson.—p. 74.
Effects of Intranasal Inoculation with Tubercle Bacilli on Vitamin A Stores and Tissues of Mice and Rats. A. B. McCoord, C. P. Katsampes and S. W. Clausen.—p. 84.

Results of Pneumolysis.—Marcus and Pinner studied the records of 302 consecutive patients who were subjected to thoracoscopy during the course of treatment for pulmonary tuberculosis. Thirteen of the 302 patients had bilateral simultaneous pneumothorax and thoracoscopy was performed on each side, thus bringing the total pneumothoraces under consideration up to 315. Complete pneumolysis was performed 88 times, partial pneumolysis was performed 142 times, insignificant pneumolysis was performed 31 times and thoracoscopy only was performed 140 times, so that the total number of operations was 401. As a result of 315 pneumothoraces 126 patients (40 per cent) were benefited by the operative procedure directly, while 125 (39.7 per cent) did well during the later course of observation, some by the institution of other treatment. All but 42 patients (13.9 per cent) have been observed for from two to more than six years. Serious complications were generally due to the development of postoperative empyema, the incidence of which was 4 per cent in 401 operations. Ten of 16 patients who developed empyema died, an incidence of 3.2 per cent for the total number of 302 patients. The authors feel that a conservative attitude in approaching adhesions is justified.

Vaccination with Vole Bacillus.—Birkhaug compared the protective value of the multiple puncture and intravenous vaccination of guinea pigs with the vole bacillus. Ninety days after the vaccination with the vole bacilli all animals in the multiple puncture, intracutaneous and control groups were inoculated subcutaneously with 0.00001 mg. of human virulent tubercle bacilli. Quantitative assessment of tuberculous hyperplasia of the various lymph nodes and viscera revealed that the vaccination with the vole bacillus offers a relatively high protection against a test infection with virulent human tubercle bacilli and that the multiple puncture method yields results which lie slightly ahead of those observed with the intracutaneous method. In a small series of human experiments the vole bacillus vaccine and the BCG vaccine were applied with the multiple puncture method to 12 women between the ages of 17 and 44 and to 6 men between the ages of 17 and 41. Multiple puncture vaccination with the vole bacillus (Wells) produced more permanent vaccination marks and stronger tuberculin reactions than a similar vaccination with BCG, suggesting a lesser margin of safety for the vole bacillus as a vaccine for use on man.

Annals of Allergy, Minneapolis

4:247-338 (July-Aug.) 1946

Bronchial Asthma in Young Male Adult: Study of 100 Hospitalized Patients in an Army General Hospital, with Special Reference to Nasal Symptoms and Findings. F. L. Rosen.—p. 247.
Influence of Liver in Anaphylactic Shock: Experimental Study. A. Graña.—p. 261.
*Mango Dermatitis and Its Relationship to Poison Ivy Hypersensitivity. H. Keil, D. Wasserman and C. R. Dawson.—p. 268.
Some Clinical Observations on Use of Benadryl for Symptomatic Relief of Allergic Conditions: Report of 188 Cases. L. C. Todd.—p. 282.
*Benadryl in Treatment of Erythema Exudativum Multiforme. H. Pinkus.—p. 288.
Sensitivity to Thiamine Hydrochloride: Potential Hazard in Common Office Procedure. H. T. Engelhardt and V. C. Baird.—p. 291.
Malaria and Urticaria. H. H. Golz.—p. 293.
Generalized Chronic Dermatitis Due to Tattoo: Case. B. Swinny.—p. 295.

Mango Dermatitis and Poison Ivy Hypersensitivity.—Keil and his associates report a case of mango dermatitis. This type of dermatitis is likely to be encountered with increasing frequency owing to the increasing consumption of the fruit and to the close immunologic relation to hypersensitiveness to poison ivy and related plants. Experimental studies on 39 subjects showed that the irritant is the stem sap which often contaminates the external surface of the peel. The majority of the 39 subjects had had no prior contact with the mango fruit. Based on the responses to 3-n-pentadecyl catechol, which was the standard method of detecting hypersensitiveness to poison ivy, the subjects could be classified in two categories: 1. A group of 14 persons who were not sensitive to poison ivy, all of whom showed negative responses to various portions of mango fruit, including the stem sap. 2. A group comprising 25 persons sensitive to poison ivy, 9 of whom were seen in a clinical attack of poison ivy dermatitis. In this group cross reactions were obtained from stem sap in 14 of 21 persons and from the internal surface of the peel in 6 of 24 persons. When comparisons were made on a quantitative basis it was found that the specimen of mango stem sap was about equivalent in its cutaneous effects to 0.1 per cent 3-n-pentadecyl catechol. All subjects who were observed in a clinical attack of poison ivy dermatitis showed positive patch tests to the stem sap and some of them to the internal surface of the peel. The possibility that persons sensitive to poison ivy are more easily sensitized to the mango plant was illustrated by 2 persons in the control group.

Benadryl in Erythema Exudativum Multiforme.—Pinkus used benadryl in 2 cases of idiopathic erythema multiforme in which high doses of sodium salicylate had produced only temporary alleviation. The cutaneous and general symptoms were relieved in both cases with surprising promptness by comparatively small doses of benadryl. Two later recurrences in 1 of the cases also responded quickly to the same therapy. One case of toxic erythema following vaccination and 1 of erythematous drug eruption subsided with similar rapidity.

Archives of Neurology and Psychiatry, Chicago

56:133-244 (Aug.) 1946

Course and Rate of Regeneration of Motor Fibers Following Lesions of Radial Nerve. S. Sunderland.—p. 133.
*Electric Shock Therapy of Elderly Patients. F. Feldman, S. Susselman, B. Lipetz and S. E. Barrera.—p. 158.
Pattern of Metabolic Depression Induced with Pentothal Sodium. B. Etsten, G. E. York and H. E. Himwich.—p. 171.
Effects of Antibiotic Substances on Central Nervous System. H. C. Johnson, A. E. Walker, T. J. Case and J. J. Kollros.—p. 184.
Abnormal Delay of Visual Perception. E. Sachs.—p. 198.
Dominant Brain Wave Frequencies as Measures of Physicochemical Processes in Cerebral Cortex. I. C. Kaufman and H. Hoagland.—p. 207.
Is Restoration of Inhibited Conditioned Reactions by Insulin Coma Specific for Pavlovian Inhibitions? Contribution to Theory of Shock Treatment. E. Gellhorn.—p. 216.

Electric Shock Treatment of Elderly Patients.—Feldman and his associates present observations on 53 patients over 65 years of age who were subjected to shock treatment at the Albany Hospital. The significance of an impaired cardiovascular system in the patient with serious mental illness must be evaluated in terms of what the future holds for the patient with and without treatment. When a diagnosis other than senile dementia can be made in a patient over 65, especially that of depressive, manic or paranoid psychosis, electric shock treat-

ment should be considered. The only contraindications should be extreme defects in the physical state, particularly in the cardiovascular system. The value of the treatment is seen in the high proportion of patients returned to their homes as either recovered or much improved. The figures for improvement compare favorably with those obtained in the treatment of younger patients with similar conditions, especially the depressions. The paranoid states responded least well, with 3 failures among 6 patients. The psychoneuroses, while not showing complete recovery, were greatly improved in the majority of cases.

Archives of Ophthalmology, Chicago

36:135-262 (Aug.) 1946

*Changes in Lens of Embryo After Rubella: Microscopic Examination of 8 Week Old Embryo. F. C. Cordes and Aleta Barber.—p. 135.
Night Vision: I. Comparison of the Scotopic Visual Ratings of Young Japanese and Caucasian Adults Living in Hawaii. W. J. Holmes. —p. 141.
Depth Perception and Flying Ability. L. S. S. Kirschberg.—p. 155.
Clinical Aspects of Stereopsis. C. McCulloch and Margaret Crush. —p. 171.
Alkali Burns of Eye: II. Clinical and Pathologic Course. W. F. Hughes Jr.—p. 189.
Animal Operating Equipment for Experimental Ocular Surgery. H. M. Katzin.—p. 215.
Scotoma as Complication of Decompression Sickness. R. H. Whitten. —p. 220.

Changes in Lens of Embryo After Rubella.—Microscopic examination of the eye of a 7 to 8 week embryo with a history of rubella during the sixth week of pregnancy revealed to Cordes and Barber definite changes in the lens. The lens showed retardation of development and differentiation, while the posterior segment of the eye seemed normal. The absence of the protection of the lids and of Descemet's and Bowman's membranes during the first three months of pregnancy may permit the toxic agent in the amniotic fluid to act directly on the lens during this time. The presence of these barriers after the third month may explain the absence of initial changes in the lens after that time. The study of more specimens is necessary in order to evaluate the changes reported here.

Bull of the U. S. Army Med. Dept., Washington, D. C.

6:91-202 (Aug.) 1946

Pulmonary Infarction. J. Chasnoff.—p. 125.
Surgery in the Field for Wounds of Abdomen. F. B. Berry.—p. 140.
Tropical Acne. M. B. Sulzberger, F. Addenbrooke, S. J. Joyce, S. Greenberg and A. G. Mack.—p. 149.
Mobile Laboratory in North Africa. G. H. Gowen.—p. 155.
Administrative Aspect of Combat Neurosis. M. Hayman.—p. 160.
Convalescence from Scrub Typhus. B. J. Romeo.—p. 167.
Preventive Medicine. P. S. Strong.—p. 174.
Trichomonad and Hemoproteus Infections. C. A. Gleiser and R. H. Yager.—p. 177.

California Medicine, San Francisco

65:1-42 (July) 1946

Technic and Interpretation of Lower Extremity Venograms. E. R. Miller.—p. 1.
Hypoparathyroidism. W. P. Kroger.—p. 3.
Use of Anticoagulants Heparin and Dicumarol. S. P. Lucia.—p. 5.
Prepayment and Future of American Medicine. J. C. McCann.—p. 9.
What War Taught About Amputations. P. F. Olson.—p. 16.
Maternal, Fetal and Neonatal Mortality. D. G. Morton.—p. 18.
Pyelitis of Pregnancy. W. D. Clark.—p. 21.

65:43-92 (Aug.) 1946

Demerol Analgesia in Obstetrics. A. Maximov.—p. 43.
*Treatment of Thromboembolism by Vein Interruption. L. Goldman and S. G. Johnson.—p. 47.
Coccidioidin Skin Test in Panama Canal Zone: Results of Brief Survey in Tuberculous and Nontuberculous Patients. H. A. Tucker.—p. 52.
Poliomyelitis in San Francisco. J. C. Geiger.—p. 53.
California Public Health Laboratories and Their Services to Physicians. M. H. Merrill.—p. 56.
Practical Application of Newer Methods in Control of Rodent and Insect Pests. H. F. Gray.—p. 61.
Malpractice Litigation as It Concerns the Dermatologist. C. E. Counter. —p. 64.

Vein Interruption in Thromboembolism.—Goldman and Johnson review observations in 71 cases of thromboembolism encountered in the University of California service at the San Francisco City and County Hospital during a period of twenty-six months between 1943 and 1945. Ligation of the iliofemoral venous system was resorted to in 25 cases, 30 were treated by other means than ligation, and 16 were not diagnosed until necropsy and were not treated. The authors stress that ligation or interruption of the iliofemoral veins is a life saving procedure in patients who have had pulmonary embolism. It should be carried out early in order to prevent extension of the thrombus into the pelvic veins with resultant phlegmasia alba dolens and persistent edema. Vein ligation should not be postponed until the patient has had multiple pulmonary infarctions. Bilateral rather than unilateral ligation is preferable because the pathologic process may be symmetrical even though there are no clinical findings in one extremity. In patients with adherent vein thrombosis (thrombophlebitis) ligation should be done proximal to the thrombus. Edema is no more severe when ligation is done than when it is not and is usually lessened if ligation is carried out early.

Cancer Research, Baltimore

6:449-528 (Sept.) 1946

*Pathologic Effects of Instantaneous Dose of Radiation. S. Warren. —p. 449.
Carcinogenic Activity of Some New Derivatives of Aromatic Hydrocarbons: II. Compounds Related to 1,2-Benzanthracene. C. E. Dunlop and S. Warren.—p. 454.
Effect of Diets Containing Abundance of Milk, Liver, Riboflavin and Xanthine on Methylcholanthrene Carcinogenesis. L. C. Strong and F. H. J. Figge.—p. 466.
Pathology of Malignant Histiocytoma (Reticuloendothelioma) of Liver in Mice. P. A. Gorer.—p. 470.

Pathologic Effects of Instantaneous Dose of Radiation.—Warren presents studies on the atomic bomb effects at Nagasaki and Hiroshima, which were carried on under the direction of the Naval Medical Research Institute and the Naval Technical Mission to Japan. Particular attention was given to the injuries due to radiation, although as the patients were studied it became apparent that the same one might be suffering from blast effect, thermal injury and radiation injury simultaneously. Two stages of radiation injury are differentiated, the immediate and the delayed. As the result of the extreme disorganization no adequate material exists to determine the exact nature of immediate effects, but Warren assumes that there is little morphologic evidence other than leukopenia and loss of adrenal lipoid. Material on the delayed effects was extensive. Over 800 patients were hospitalized by the author's group and about 13,000 were surveyed. Most leukopenic deaths occurred during the first three weeks subsequent to the bombing. From three to five weeks after the bombing a considerable number of hemorrhagic deaths occurred, associated with the thrombocytopenia induced by radiation damage to the megakaryocytes of the bone marrow. Those with serious bone marrow damage who weathered the first few weeks showed later anemic manifestations, with red blood cell counts in some instances dropping to 1 million or below. The gonadal effect was much more prominent in the testis than in the ovary.

Connecticut State Medical Journal, Hartford

10:625-736 (Aug.) 1946

Medicine During World War II. P. H. Long.—p. 627.
Transverse Myelitis. J. C. Allen.—p. 637.
Treatment of Psychopathic Personality. F. S. DuBois.—p. 640.
Legg-Perthes' Disease: Report of 5 Cases in Adult Men. F. D. T. Bowen.—p. 644.
Voluntary Funds in Cancer Control. E. R. Meiss.—p. 648.
Organization of Group Clinic. D. K. Bartlett Jr.—p. 650.
Job of State and County Societies in Medical Public Relations. C. C. Burlingame.—p. 655.

10:737-814 (Sept.) 1946

Nutrition During Pregnancy. Bertha S. Burke.—p. 744.
Physiologic Basis of Electric Convulsive Therapy. W. T. Liberson. —p. 754.
Use of Curare in Shock Therapy in Cases Complicated by Pathologic Skeletal Conditions. B. H. Gottesfeld.—p. 756.
Fluorine, Deterrent in Dental Caries. F. M. Erlenbach.—p. 759.
Periarteritis Nodosa (Neuromuscular Type). H. H. Irwin and C. M. Mezey.—p. 761.
Optic Neuritides. F. L. P. Koch.—p. 763.
Tumor Clinic in Small Hospital. L. G. Simon.—p. 765.
Significance of Comprehensive Medical Care. D. P. Barr.—p. 767.

Gastroenterology, Baltimore

7:1-152 (July) 1946

*Results of Hepatic Tests in Chronic Hepatitis Without Jaundice. J. R. Neefe.—p. 1.

Study of Time of "Healing" of Peptic Ulcer in Series of 69 Cases of Duodenal and Gastric Craters. G. M. Cummins, M. I. Grossman and A. C. Ivy.—p. 20.

*Nocturnal Gastric Secretion: II. Studies on Normal Subjects and Patients with Duodenal Ulcer. D. J. Sandweiss, M. H. F. Friedman, M. H. Sugarman and H. M. Podolsky.—p. 38.

Complications of Chronic Nonspecific Ulcerative Colitis. W. E. Ricketts and W. L. Palmer.—p. 55.

Etiology of Ulcerative Colitis: Analytic Review of Literature. R. S. Ginsberg and A. C. Ivy.—p. 67.

Some Results of Gastric Secretory Response of Patients Having Duodenal Ulcer Noted During Administration of Benadryl. R. U. Moersch, A. B. Rivers and C. G. Morlock.—p. 91.

Clinical Observations on Use of Benadryl: Its Effect on Histamine Induced Gastric Acidity in Man. T. W. McElin and B. T. Horton. —p. 100.

Separation and Assay of Secretin and Cholecystokinin. H. Doubilet. —p. 108.

Hepatic Tests in Chronic Hepatitis Without Jaundice.—In the course of investigations on infectious hepatitis in human volunteers, Neefe observed 4 cases of chronic hepatitis without jaundice. The chronic form of the disease followed an attack of acute infectious hepatitis with jaundice, although in case 2 the icterus associated with the acute attack was transient and subclinical. In cases 1, 2 and 3 the acute hepatitis had been induced by the oral administration of a feces preparation known to contain the causative agent of infectious (epidemic) hepatitis. In the fourth case, observed in a hospital, the infectious hepatitis had been acquired under natural circumstances. In all these cases the duration of the illness exceeded seven months and a diagnosis of chronic hepatitis without jaundice was made on the basis of the history, the clinical manifestations, laboratory evidence and, in cases 1 and 2, on the microscopic findings in liver biopsy specimens obtained nine and six months respectively after the onset of acute hepatitis. The course of the disease after the seventh month was one of progressive improvement, and in 2 cases complete recovery appears to have been achieved. In the later stages of the disease, it was found that the commonly used hepatic tests failed to reveal hepatic disturbance, although incapacitating symptoms continued and liver biopsies showed persistent hepatitis.

Nocturnal Gastric Secretion.—Sandweiss and his associates studied nocturnal gastric secretion in 38 normal subjects and 29 patients with duodenal ulcer. They arrive at the conclusion that following a fairly well balanced meal at 6 p. m. a normal person secretes acid gastric juice during the night. An average of 446 cc. of gastric juice was obtained by continuous suction from 12 midnight to 7 a. m. (minimum 190 cc., maximum 800 cc.). There is no statistically significant difference in the volume and total output of acid of nocturnal gastric secretion of normal subjects and patients with uncomplicated duodenal ulcer when determined by continuous aspiration. The greater volume of gastric juice observed when intermittent single aspirations are made from patients with uncomplicated duodenal ulcer is not due to gastric hypersecretion. The authors emphasize the need for additional studies on nocturnal gastric secretion on both normal subjects and ulcer patients by the continuous aspiration method.

Journal of Aviation Medicine, St. Paul

17:207-270 (June) 1946

Electrocardiograms of Older Pilots. F. A. L. Mathewson and A. H. Sellers.—p. 207.

Fatal Aviation Accidents. M. M. Kalez and R. C. Hovde.—p. 234.

Analysis of Symptoms Causing Forced Descents in Altitude Chambers at San Antonio Aviation Cadet Center. G. P. Fulton and S. Phillips. —p. 244.

Physical Fatigue in Single Control Military Aircraft. H. R. Bierman. —p. 253.

Incidence and Relation of Syncope to Decompression Sickness. B. R. Brown.—p. 257.

Studies of Effects of Morphine at Simulated High Altitudes and Its Use for Relief of Pain of Decompression Sickness. P. K. Smith. —p. 265.

Psychologic Requirements in Aviation Equipment Design. P. M. Fitts. —p. 270.

Journal of Experimental Medicine, New York

84:113-190 (Aug.) 1946

Reactions of Monkeys to Experimentally Induced Influenza Virus A Infection: Analysis of Relative Roles of Humoral and Cellular Immunity Under Conditions of Optimal or Deficient Nutrition. S. Saslaw, H. E. Wilson, C. A. Doan, O. C. Woolpert and J. L. Schwab.—p. 113.

Type Specific Protection and Immunity Following Intranasal Inoculation of Monkeys with Group A Hemolytic Streptococci. R. F. Watson, S. Rothbard and H. F. Swift.—p. 127.

Preparation and Properties of Shiga Toxin and Toxoid. Rene J. Dubos and J. W. Geiger.—p. 143.

Fate of Injected Particulate Antigens in Relation to Formation of Antibodies. T. N. Harris and W. E. Ehrich.—p. 157.

Specificity of Serologic Precipitation. F. Lanni.—p. 167.

Effect of In Vitro Cultivation on the Pathogenicity of West Nile Virus. H. Koprowski and E. H. Lennette.—p. 181.

84:191-276 (Sept.) 1946

Inhibition of Phosphorylation of Glucose in Mouse Brains by Viruses and Its Prevention by Preparations of Diphosphopyridine Nucleotide. E. Racker and I. Krimsky.—p. 191.

Effect of In Vitro Cultivation on Pathogenicity of Venezuelan Equine Encephalomyelitis Virus. H. Koprowski and E. H. Lennette.—p. 205.

Production of Chronic Glomerulonephritis in Rats by Injection of Rabbit Anti-Rat Placenta Serum. Beatrice Carrier Seegal and Emily Nichols Loeb.—p. 211.

Studies on Flexner Group of Dysentery Bacilli: IV. Serologic and Toxic Properties of Somatic Antigens. E. Perlman and W. F. Goebel. —p. 223.

Id.: V. Quantitative Study of Serologic Cross Reactions. E. Perlman and W. F. Goebel.—p. 235.

Further Studies on Effects of Tissue Extracts on Staphylococcus Aureus. L. G. Nutini and Eva Maria Lynch.—p. 247.

Reactions of Monkeys to Experimentally Induced Streptococcus Hemolyticus, Group C, Infection: Analysis of Relative Roles of Humoral and Cellular Immunity Under Conditions of Optimal or Deficient Nutrition. S. Saslaw, H. E. Wilson, C. A. Doan, O. C. Woolpert and J. L. Schwab.—p. 263.

Journal of Lab. and Clinical Medicine, St. Louis

31:721-828 (July) 1946

*Nutritional Survey of Starvation in Group of Young Men. C. S. Davidson, H. L. Wilcke and P. J. Reiner.—p. 721.

Action of Thiobismol on Therapeutic Quartan Malaria. L. I. Kaplan, H. S. Read and F. T. Becker.—p. 735.

Distribution of Atabrine in Blood, Skin and Its Appendages: Methods for Rapid and Simple Detection of Presence of Atabrine in Blood, Skin and Nails. K. Lange and M. J. Matzner.—p. 742.

Pyribenzamine (N'-Pyridyl-N'-Benzyl-N-Dimethylethylene-Diamine HCl), an Antagonist of Histamine. R. L. Mayer, H. W. Hays, D. Brousseau, D. Mathieson, B. Rennick and F. F. Yonkman.—p. 749.

Studies on Toxicity of Sulfonamide Drugs: I. Porphyrin Excretion by Patient Treated with Sulfadiazine and Later with Sulfanilamide. F. H. J. Figge, T. N. Carey and G. S. Weiland.—p. 752.

Observations on Activity in Vitro of Succinylsulfathiazole and Phthalylsulfathiazole. H. J. Florestano and J. F. Kennedy.—p. 757.

Fate of Sodium Ricinoleate After Oral Administration to White Rats. E. L. MacQuiddy, Elizabeth Pinkerton, H. Goetze and F. W. Oberst. —p. 763.

Observations on Effect of Lowered Oxygen Tension on Sicklemia and Sickle Cell Anemia Among Military Flying Personnel. A. B. Henderson and H. E. Thornell.—p. 769.

Bone Marrow in Hemophilia During Life: Study of Cellular Elements and Coagulation Time of Marrow Blood. L. R. Limarzi, H. G. Poncher and C. L. Birch.—p. 777.

Unusual Case of Generalized Anasarca Appearing in Impounded Dog with Cirrhosis of Liver. Lillian Eichelberger and M. Roma.—p. 785.

Sensitization of Rh Positive Patients by Rh Factor. L. J. Unger.—p. 793.

Traumatic Effects of Positive Intratracheal Pressures. H. Tatum and A. M. Ginzler.—p. 799.

Starvation in Young Men.—Davidson and his associates present observations on 171 men suffering from a severe degree of starvation. The men were German prisoners who were seen between two and three months after imprisonment; during this interval the value of the food eaten varied between 650 and 850 calories daily. Food eaten before the time of capture may not have been entirely adequate. Extreme wasting was evident and was usually associated with lethargy, a stooped posture, weakness and often syncope. Comparison of actual weight with data given in standard height and weight tables showed that all the men were under the standard of weight, the average being 13 Kg. below the standard. Joint pains were common, particularly in the knees. Diarrhea was a frequent complaint. A generalized pigmentation was observed. There was a high incidence of follicular hyperkeratosis, 4 instances of circumcorneal injection, 3 instances of color change in the tongue and 8 instances of papillary atrophy of the tongue. Eye signs suggesting vitamin A deficiency were not observed. A condition

resembling acrocyanosis was observed in the distal extremities of many of these men and was often associated with paresthesias. Edema, probably of nutritional origin, was observed in 24 per cent of these men. Hypoproteinemia was common but was not present in a significant number of the men with edema. Anemia was not severe.

31:829-938 (Aug.) 1946

Elimination of Human Reaction Producing Material from Horse Derived Antiserums: Electrical Method. E. Cardone.—p. 829.
Study of Abnormal T Waves in Patients Presenting No Evidence of Organic Heart Disease. I. Stein.—p. 837.
Observations on Effect of Theophylline Aminoisobutanol in Experimental Heart Failure. J. R. Smith and J. Jensen.—p. 850.
Effect of Theophylline Aminoisobutanol on Circulation in Congestive Heart Failure. F. U. Steinberg and J. Jensen.—p. 857.
Stimulation of Central Nervous System by Curare (Intocostrin). Rosellen E. Cohnberg.—p. 866.
Hemoglobin Levels in Specific Race, Age and Sex Groups of Normal North Carolina Population. D. F. Milam and H. Muench.—p. 878.
*Hematologic Survey of Repatriated American Military Personnel. G. E. Cartwright and M. M. Wintrobe.—p. 886.
Absorption and Excretion of Sulfathiazole and Sulfamethylthiadiazole After Oral Administration in Human Beings. M. Meads and M. Finland.—p. 900.
Quantitative Determination of Thymol Turbidity Reaction of Serum. A. B. Ley, Jessica H. Lewis and C. S. Davidson.—p. 910.

Hematologic Survey of Repatriated American Military Personnel.—Cartwright and Wintrobe made hematologic studies on 75 repatriated American prisoners of war selected from a series of 3,000. These men had been on a grossly inadequate diet consisting mainly of rice for an average of 40.1 months. The average weight loss was 37 pounds (17 Kg.). A history of nutritional deficiency as characterized by cheilosis, glossitis, stomatitis, dermatitis and diarrhea was obtained in from 50 to 70 per cent. A history suggesting wet beriberi was obtained in 77 per cent and a history of dry beriberi in about 50 per cent. Among the 75 patients studied in detail, the anemia was macrocytic in 73 per cent, normocytic in 23 per cent and microcytic in 4 per cent. Thrombocytopenia was present in 1 patient who had a mild elevation of the icterus index. In the remaining cases the icterus index was normal. Mild reticulocytosis and leukocytosis were frequently encountered. Blood films showed numerous macrocytes, anisocytosis, polychromatophilia and an occasional nucleated red blood cell. In approximately half of the men studied, normal serum iron and copper values were found. The other half were characterized by hypoferremia and hypercupremia. It is suggested that most of the men examined probably presented the recovery phase of severe nutritional macrocytic anemia. The 3 cases of microcytic anemia were most likely due to blood loss.

Journal of Nervous and Mental Disease, New York

104:123-236 (Aug.) 1946

Treatment of Psychiatric Disorders Due to Combat by Means of Group Therapy Program and Insulin in Subshock Doses. H. A. Teitelbaum, C. S. Hockstra, D. N. Goldstein, I. D. Harris, R. M. Woods and D. Cohen.—p. 123.
Use of Bellevue-Wechsler Scale in Clinical Psychiatry, with Particular Reference to Cases with Brain Damage. Rosaline Goldman, M. Greenblatt and G. P. Coon.—p. 144.
Psychiatric Nomenclature: I. Psychiatric Disorders and Reactions: Definitions and Manner of Recording.—p. 180.
Syphilitic Meningitis with Negative Blood and Spinal Fluid Serology: Report of Rare Syndrome. L. I. Kaplan, H. S. Read and F. T. Becker.—p. 200.

Military Surgeon, Washington, D. C.

99:89-176 (Aug.) 1946. **Partial Index**

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Venereal Disease Control in Rural Area in Wartime. W. B. Quisenberry and J. N. Dudley.—p. 98.
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Temporary Facial Prostheses as Aid in Treatment of War Injuries. L. Emory.—p. 105.
Unexplained Amblyopia as Military Problem. J. W. Hallett.—p. 110.
Complications of Scabies. W. M. Libman.—p. 116.
Acute Injuries of First Metacarpal in Military Personnel. R. E. van Demark.—p. 127.
Aid to Handling of Patients in Hip Spica Casts (Report of Case). C. F. Goeringer.—p. 130.
Improvised Oxygen Tent. W. C. Beck and Elizabeth Dunham.—p. 133.
Field Construction of Improved Slit Lamp and Chin Rest. M. N. Young.—p. 134.

Minnesota Medicine, St. Paul

29:641-736 (July) 1946

Sociologic Pathology of Medicine. E. J. Simons.—p. 673.
Brucellosis—Clinical Aspects. W. H. Hall.—p. 679.
Progress in Control of Brucellosis (Bang's Disease) in Domestic Animals. W. L. Boyd.—p. 681.
Treatment of Medical Jaundice. J. L. Diamond.—p. 684.
Hypersensitivity to Penicillin Simulating Serum Sickness. W. S. Eisenstadt.—p. 689.
Ethylene Disulfonate in Allergy. J. S. Blumenthal.—p. 690.
Ruptured Diverticulum of Jejunum. W. R. Bagley and C. M. Bagley.—p. 691.
Industrial Health in Navy War Plants. D. J. Lauer.—p. 693.

29:737-848 (Aug.) 1946

Poliomyelitis: Review of Its Epidemiology, with Especial Consideration of Autarceologic Concept of Immunity. A. G. Berger.—p. 761.
Leprosy. W. J. Simon.—p. 771.
Surgical Treatment of Thrombophlebitis. J. R. Paine.—p. 774.
Anticoagulant Therapy in Postoperative Thrombophlebitis and Pulmonary Embolism. N. W. Barker.—p. 778.
Neonatal Deaths Following Term Deliveries, 1937 to 1945: Cause and Effect Relationships. R. W. Dickman.—p. 783.
Subacute Bacterial Endocarditis with Rupture of Spleen. A. J. Hertzog, G. Nesse and C. Vandersluis.—p. 791.

Missouri State Medical Assn. Journal, St. Louis

43:517-580 (Aug.) 1946

Palliative Roentgen Therapy of Bone Metastases from Breast Carcinoma. L. R. Sante.—p. 533.
Resistance to Antibiotic Agents. R. H. Rutherford, G. H. Marquardt and A. C. Van Ravenswaay.—p. 535.
Treatment of Minor Burns Acquired in Laboratory and at Home. S. Malkiel and W. C. Boyd.—p. 538.
Use of Large Daily Injections of Penicillin Emulsion in Dermatology. C. C. Dennie and D. B. Morgan.—p. 539.

43:581-660 (Sept.) 1946

Water Balance: Normal Mechanism, Methods of Administration, Dangers. R. O. Muether.—p. 599.
Water and Electrolyte Balance in Surgical Patients. R. Elman.—p. 602.
Medical Problems of Acid-Base Balance. J. B. Stubbs.—p. 603.
Thyroid Dysfunction. A. McMahon.—p. 606.

New England Journal of Medicine, Boston

235:179-206 (Aug. 8) 1946

*Schistosomiasis Japonica: Diagnosis and Treatment in American Soldiers. P. K. Mason, W. B. Daniels, F. K. Paddock and H. H. Gordon.—p. 179.
Wartime Activities of the Army Medical Department. N. T. Kirk.—p. 182.
Scurvy: Survey of 241 Cases. I. Dogramaci.—p. 185.
*Tonic Effects of Insulin in Acute Alcoholism. E. G. Vassaf and V. R. Hall.—p. 190.
Diseases of Veins. J. Homans.—p. 193.
Endometriosis of Sigmoid, Rectum, Bladder and Left Ovary.—p. 199.
Benign Gastric Ulcer, with Penetration into Pancreas.—p. 201.

Schistosomiasis Japonica in American Soldiers.—Following the invasion of Leyte, cases of schistosomiasis japonica began to appear among army personnel. Mason and his associates describe investigations on 481 patients. Several weeks after exposure the patients developed chills, sweats, generalized malaise, lethargy, headache, anorexia, mild diarrhea and abdominal pain, with weight loss. Urticaria and jaundice were observed in some cases. Examination revealed a slightly enlarged and tender liver and occasionally an enlarged spleen. Leukocytosis with eosinophilia was usual. Four to nine months after their acute illness, patients were evacuated to this country. On arrival they did not appear ill. The only abnormalities were recurrent cramps and tenderness in the upper abdomen. A slightly enlarged liver was felt in 10 per cent of the patients. During observation for three months or more the patients tended to improve. On discharge almost all were free from symptoms. Eggs were found either overseas or here in 80 per cent of these patients. In the remainder the clinical history was sufficiently characteristic to warrant little doubt of the diagnosis. A persistent eosinophilia was suggestive but not diagnostic of continued activity of the disease. On the basis of comparable series, treatment with antimony and potassium tartrate was found to be much more effective than treatment with fuadin. Significant toxic reactions with antimony and potassium tartrate were rare. It is urged that stool examinations be done repeatedly and by multiple methods on men who have been exposed to this disease so that treatment may be instituted if ova are found.

Tonic Effects of Insulin in Acute Alcoholism.—Vassaf and Hall report observations on 43 patients with uncomplicated alcoholic intoxication who were treated with small doses of insulin but who were not given the usual liberal amounts of dextrose. During the gradual withdrawal of alcohol they were given 10 units of insulin two or three times daily before meals. The insulin-treated cases as compared with the control group showed the following clinical differences: The average speed of the withdrawal period was twice as great. Three times as many patients neither required nor demanded whisky after admission. Subjective comfort during the withdrawal period was increased. Supplementary sedation was greatly reduced, in some cases to zero. The weight gain was increased by threefold, both during the first week of hospitalization and subsequently. Insulin reactions were rare and mild, being readily controlled by oral sugar. The coverage of clinically effective doses of insulin by dextrose as such is apparently not a necessity.

235:207-238 (Aug. 15) 1946

*Scleredema: Systemic Disease. B. L. Vallee.—p. 207.
*Some Unusual Findings in Epidemic of Anterior Poliomyelitis. J. H. Nicholson.—p. 214.
Tetanus, with Death Due to Aseptic Dural Sinus Thrombosis: Case. E. T. Phelps.—p. 218.
Pulmonary Tuberculosis. J. D. Wassersug.—p. 220.
Epidermoid Carcinoma of Bronchus (Grade III).—p. 230.
Bronchiectasis of Left Lower Lobe.—p. 232.

Scleredema.—Vallee says that the condition was first described by Buschke in 1900 and that since then 99 cases have appeared in the literature. To this number he adds 4, all of which were observed at Mount Sinai Hospital within the last six years. The disease is characterized by firm, nonpitting edema, affecting usually the face, neck, scalp, conjunctivas, thorax, occasionally the arms and more rarely the legs, sparing the hands and feet. Pleural effusions, pericardial effusions and hydrarthroses also occur. The pericardial effusions may be localized. The electrocardiogram shows low voltage of the QRS complexes. Young people are affected more frequently than those in the older age groups. Women are affected twice as often as men. The treatment was unsatisfactory. Vallee's therapeutic trials included desiccated thyroid, dihydrotachysterol and anterior pituitary extract. These agents did not contribute greatly to recovery.

Unusual Aspects in Epidemic of Anterior Poliomyelitis—During March and April 1945 a southern army post experienced a short outbreak of anterior poliomyelitis. Within a period of twenty-five days 18 patients with poliomyelitis were admitted to the hospital. All the cases occurred in soldiers; all but 3 were between 18 and 21 years old. The patients showed some unusual findings. There were 10 with bulbar involvement. There were 3 deaths, all of patients with bulbar involvement and all caused by failure of the respiratory center. A large percentage of the patients failed to show the cellular response usually seen in the spinal fluid in poliomyelitis. The albuminocytologic disassociation described in the Guillain-Barré syndrome was found in 3 of the 18 cases in this series.

New Orleans Medical and Surgical Journal

99:1-46 (July) 1946

Treatment of Common Dermatoses of Infancy and Childhood. J. W. Burks Jr.—p. 1.
Lanatoside C (Cedilanid). S. P. Wise.—p. 7.
Congenital Cystic Disease of Lung. J. Gardner.—p. 15.
Bone Marrow in Diseases of Leukopoietic System. G. E. Welch.—p. 21.

99:47-94 (Aug.) 1946

Surgical Treatment of Hernia. H. N. Harkins.—p. 47.
Pulmonary Hypertension. C. J. Ray.—p. 49.
Relation of Hypertension to Vascular Disease. A. V. Mortensen.—p. 56.
Gastric Polyposis. J. H. Rappeport.—p. 71.

Oklahoma State Medical Assn. Jour., Oklahoma City

39:289-326 (July) 1946

Rheumatic Myocarditis. R. H. Bayley.—p. 289.
Endocrine Complaints in Eye, Ear, Nose and Throat Area. E. H. Coachman.—p. 292.
Surgery in Treatment of Stomach and Duodenum. C. C. Fulton.—p. 297.

Pennsylvania Medical Journal, Harrisburg

49:1177-1304 (Aug.) 1946

Report of 13,113 Complete Physical Examinations of Philadelphia Public School Pupils. H. R. Owen and Ruth H. Weaver.—p. 1193.
Laryngeal Stridor in Children. D. S. DeStio.—p. 1195.
Evaluation of Oral Penicillin with Reference to Treatment of Urinary Tract Infections. S. W. Mulholland, L. D. Seager, Ruth E. Miller and W. Shoemaker.—p. 1200.
Gastroduodenal Ulcer. C. H. Arnold.—p. 1205.
Why Neurotics? Veteran Problem: Normal Adjustments of Veterans. C. N. Davis.—p. 1208.
Frigidity in Female. L. F. Ritmiller and R. E. Nicodemus.—p. 1214.
Excision of Pilonidal Cyst and Sinus with Primary Union, Using Local Infiltration and Topical Application of Penicillin Solution. J. S. Lane.—p. 1217.
Implementation of Medical Profession's Program at State Level. L. H. Perry.—p. 1219.
Sound Medical Economics at County Level. W. W. Wilcox.—p. 1225.
Present Economic Trends and State Medical Society. W. L. Estes.—p. 1226.

Plastic and Reconstructive Surgery, Baltimore

1:1-117 (July) 1946

Development of Plastic Surgery in the United States. G. Aufricht.—p. 3.
Present Evaluation of Merits of the Z Plastic Operation. J. S. Davis.—p. 26.
Release of Circular Constricting Scar by Z Flaps. T. W. Stevenson.—p. 39.
Reconstruction of Contracted Axilla. L. E. Sutton.—p. 43.
Early Covering of Extensive Traumatic Deformities of Hand and Foot. J. J. McDonald and J. P. Webster.—p. 49.
Loss of Coverage of Penis, Scrotum and Urethra. D. W. Robinson, Kathryn L. Stephenson and E. C. Padgett.—p. 58.
Closure of Skull Defects. R. Jaeger.—p. 69.
Elongation of Nasal Columella: New Operative Technic. C. LeR. Straith.—p. 79.

Radiology, Syracuse, N. Y.

47:107-212 (Aug.) 1946

Gas Formation in Abdominal Abscesses: Roentgen Study. H. S. Weens.—p. 107.
Lymphoepithelioma. G. M. Tice.—p. 116.
Significance of the Sacroiliac Findings in Marie-Strümpell's Spondylitis. J. Borak.—p. 128.
Solitary Cyst of Calcaneus. B. Copleman, M. F. Vidoli and F. J. Crimmings.—p. 142.
*Pulmonary Torulosis. J. B. Hamilton and G. R. Tyler.—p. 149.
Congenital Cystic Disease of Lung. W. Savain and J. E. Bryant.—p. 156.
Normal Lateral Retrograde Pyelogram. J. M. Dell Jr. and C. H. Barnwell.—p. 163.
Measurement of Resolving Power of Intensifying Screens. W. W. Van Allen and R. H. Morgan.—p. 166.
Roentgen Findings in Erythema Nodosum. W. L. Bonnet.—p. 175.
Versatile Erect Bucky for Private Office Radiography, with Description of Horizontal Bucky Table Mounted on Floor Track. G. W. Heublein.—p. 178.
Unsuspected Pneumoperitoneum. H. A. Cole and C. J. Berne.—p. 183.
Absorption of Pantopaque Following Myelography. W. G. Peacher and R. C. L. Robertson.—p. 186.

Pulmonary Torulosis.—Hamilton and Tyler report 1 case of Torula infection involving both the central nervous system and lungs in a woman aged 24. Mild symptoms such as pleuritic pain and mild cough called attention to the pulmonary infection. A round opacity having the characteristics of an inflammatory lesion in the upper portion of the left lower lobe was demonstrated on roentgenologic examination. Symptoms referable to the central nervous system were manifested four months after the occurrence of the lung lesion. Spinal fluid cultures revealed a budding yeast organism typical of Torula histolytica. Saturated solution of potassium iodide 3 minims (0.2 cc.) three times daily was given, and the dosage was eventually increased to 15 minims (1 cc.) three times daily. One week after institution of this treatment a chest roentgenogram showed partial clearing of the lung lesion, but no clinical improvement occurred. Sulfathiazole, acriflavine and 110,000 units of penicillin proved ineffective. The neurologic symptoms increased and death ensued seven months after the onset of the first pulmonary symptoms. The possibility of pulmonary torulosis should be borne in mind when there is a persistent asymptomatic or relative asymptomatic parenchymal lesion which has inflammatory characteristics and which is resistant to diagnosis by ordinary laboratory procedures, especially if the patient is showing no evidence of a malignant neoplasm.

The changes occurring in the lungs, as reported by others, may assume various appearances and are not characteristic of the disease but usually suggest the possibility of tuberculosis. The lung lesion may precede by months the onset of central nervous system symptoms.

Rhode Island Medical Journal, Providence

29:485-568 (July) 1946

Virus Type of Infectious Hepatitis. G. Blumer.—p. 499.
Progress in Cerebral Palsy. E. Denhoff.—p. 505.
Preliminary Report on Crawford Allen Hospital for Rheumatic Children. W. T. Zimdahl.—p. 514.
Evolution of Medical Record. H. B. Moor.—p. 523.
Cash Sickness in Rhode Island: Review of Annual Report on Cash Sickness Compensation in Rhode Island and Recent Amendments to Law. J. C. Ham, R. C. Hudson, D. A. Smith and others.—p. 532.
Medical Needs of Rural Communities. G. M. Putnam.—p. 553.

29:569-640 (Aug.) 1946

Surgical Management of Carcinoma of Colon and Rectum. T. E. Jones.—p. 583.
Gastritis Among Navy Personnel. R. S. Bray.—p. 586.
Conservation of Pulmonary Function in Treatment of Chest Casualties. D. B. Jennison.—p. 589.
A. M. A. House of Delegates. A. M. Burgess.—p. 598.
Medical Audit. H. S. Joyce.—p. 621.

Southern Medical Journal, Birmingham, Ala.

39:597-680 (Aug.) 1946. **Partial Index**

*Penicillin in Treatment of Acute Osteomyelitis, with Case Reports. J. F. Hamilton and H. B. Boyd.—p. 597.
Yaws: Treatment with Penicillin. W. D. Stubenbord.—p. 608.
*Coccidioidomycosis Treated with Penicillin: Case Report. W. T. Arnold and M. D. Levy.—p. 609.
Coccidioidomycosis. J. W. Burks Jr. and P. E. Thompson.—p. 613.
Spontaneous Pneumoperitoneum Without Peritonitis and Without Demonstrable Cause. J. M. Mason, E. M. Mason and K. F. Kesmodel.—p. 620.
Intermuscular Lipoma of Thigh with Roentgenologic Findings. H. E. Simon and H. R. Senturia.—p. 624.
Still's Disease (Atrophic Arthritis, Atrophic Rheumatoid Arthritis or Infectious Rheumatoid Arthritis). W. F. Burdick.—p. 626.
Comparison of Quinine and Quinacrine in Treatment of Clinical Attacks of Vivax Malaria. H. H. Gordon, H. B. Christianson and S. W. Lippincott.—p. 631.
*Activity of Another L. Casei Factor in Microcytic Anemia. T. D. Spies.—p. 634.
Respiratory Emergencies in Infants and Children. J. A. Toomey.—p. 635.
Intravenous Anesthesia in Anorectal Surgery. M. C. Pruitt.—p. 640.
Review of Spinal "Pentothal" Anesthesia. S. S. Clark.—p. 643.
Penicillin in Acute Pelvic Inflammatory Diseases (Nonvenereal). W. N. Jones.—p. 646.
Effect of Caffeine on Gastric Secretion. V. H. Musick, H. C. Hopps, H. T. Avey and A. A. Hellbaum.—p. 651.

Penicillin in Acute Osteomyelitis.—Hamilton and Boyd have used penicillin in the treatment of acute and chronic osteomyelitis for the past eighteen months. Histories of 11 cases are reported. The earlier the penicillin therapy is instituted, the quicker will be the response and the better the end result. There may be an occasional infection with a penicillin resistant staphylococcus. In cases not responding to penicillin one of the sulfonamides is prescribed and vice versa. There may also be cases in which the two drugs may be used simultaneously to greater advantage. In a patient with a pocket of pus infected with a susceptible pathogen, even though the action of penicillin is not inhibited by organic matter as are the sulfonamides, it may not, for physical reasons, arrest the growth of staphylococci in the abscess. Such accumulations of pus should be drained, especially if response to penicillin is delayed. Penicillin should be given for at least five days after the temperature has returned to normal, and the total amount of penicillin for patients with acute osteomyelitis should be at least 1 million units. The economic factor in reducing the length of hospitalization as the result of penicillin therapy is astounding when compared with former methods.

Penicillin in Coccidioidomycosis.—Arnold and Levy report a case in which the course was typical of acute coccidioidomycosis followed by the disseminated or granulomatous stage. A Negro aged 32, who was a waiter on a train that traveled from Texas to California through Arizona, complained of coughing, cold, low grade fever, chills, night sweats, pain in the left shoulder, substernal pains and hemoptysis. The first x-ray diagnosis was tumor of the left hilus, probably a bronchogenic carcinoma; but on bronchoscopy no tumor was found. Later a diagnosis of tuberculosis of the glandular type was made and then a questionable diagnosis of Hodgkin's disease, for which x-ray therapy was given. During a final hospitalization a chronic meningitis was diagnosed and large doses of penicillin were given intramuscularly and intraspinally, but the patient died.

Another Lactobacillus Casei Factor.—A new Lactobacillus casei factor has been described by Hutchings and his associates. The compound was obtained from a fermentation residue and was almost as active as the liver L. casei factor when assayed with L. casei, but only 6 per cent as active when assayed with Streptococcus fecalis R. When a small quantity of the natural fermentation L. casei factor became available, Spies tested it on a man aged 65 with pernicious anemia in relapse. He had responded twice to reticulogen but relapsed when he did not wish to continue the injections. This time on his fourth hospital day, a 3 mg. injection of natural fermentation L. casei factor was given intramuscularly and was repeated daily for eleven days. On the fifth day the reticulocytes had risen from 1 per cent to 2.6 per cent and on the tenth day reached a peak of 5.4 per cent. After that they subsided slowly, but by the sixteenth day the red blood cells had risen from 1.89 to 2.4 millions and the hemoglobin had likewise increased. There was also great subjective improvement. The ingestion of the material did not cause any untoward symptoms.

Surgery, St. Louis

20:163-314 (Aug.) 1946

President's Address: The Surgeon—An Individualist. R. R. Graham.—p. 163.
Massive Organizing Hemothorax: Operative Treatment, Its Technic, Indications and Pitfalls. A. F. Jonas.—p. 168.
Further Experiences in Surgical Treatment of Congenital Atresia of Esophagus with Tracheoesophageal Fistula. C. R. Lam.—p. 174.
Postoperative Pulmonary Embolism: Review of Cases from 1939 to 1944. J. J. Smyth and M. G. Gillespie.—p. 180.
Management of Pulmonary Abscess. F. M. Woods and E. J. McGrath.—p. 187.
*Acute Secondary Parotitis. W. A. Altemeier.—p. 191.
Curare—Its Rational Use as Adjunct to Anesthesia. S. C. Cullen.—p. 200.
Role of Cancellous Bone in Plastic Surgery. S. Gordon.—p. 202.
Method in Management of Multiple Facial Fractures. H. H. Campbell.—p. 204.
Tardy Median Palsy: Median Neuritis; Median Thenar Neuritis Amenable to Surgery. B. W. Cannon and J. G. Love.—p. 210.
Fundamentals of Technic in Transverse Abdominal Incision. F. N. Gurd.—p. 217.
*Resection of Duodenum and Head of Pancreas for Carcinoma. J. M. Waugh and O. T. Clagette.—p. 224.
Value of Exclusion Operation in Treatment of Intestinal Fistulas. J. G. Probstein.—p. 233.
Reconstruction of War Wounds of Colon and Rectum. J. E. Hamilton and L. M. Cattanach.—p. 237.
Transverse Colostomy. L. S. Fallis.—p. 249.
Radical Perineal Prostatectomy for Carcinoma of Prostate. J. K. Ormond.—p. 257.
Prostatic Carcinoma: Follow-Up on 795 Patients Treated Prior to Endocrine Era and Comparison of Survival Rates Between These and Patients Treated by Endocrine Therapy. R. M. Nesbit and T. Plumb.—p. 264.
Novocain Infiltration in Treatment of Acute Ankle Injuries Without Fracture. C. W. McLaughlin Jr.—p. 280.
*Metabolic Alterations Following Thermal Burns: VI. Effect of Altering Nitrogen and Caloric Intake or of Administering Testosterone Propionate on Nitrogen Balance. W. E. Abbott, J. W. Hirshfeld, H. H. Williams, M. A. Pilling and Frieda L. Meyer.—p. 284.

Acute Secondary Parotitis.—During the past nine years Altemeier has seen 49 patients with acute secondary parotitis. The ages of these patients varied between 7 and 84. The infection involved the right side in 25 instances, the left in 19 and both in 4. All but two of the infections occurred in patients debilitated by some primary disease or injury. One of the causal factors was poor oral hygiene. Dehydration, mouth breathing, suppression of salivary secretion and the existence of dental caries favored the development of an ascending infection along Stensen's duct. A sharp elevation of body temperature, pulse rate and white blood cell count usually occurred. Treatment consisted in the administration of 120 to 250 minims of Lugol's solution per day at the earliest opportunity until improvement occurred. Thereafter the daily dose was progressively reduced. The greater part was given by mouth whenever possible, and supplemental amounts were given by hypodermoclysis, intravenous infusion or proctoclysis. Treatment for the

primary disease was continued, and supportive therapy included the use of hot compresses. Early and adequate treatment with massive doses of Lugol's solution was found to give satisfactory results. Penicillin therapy in a small number of instances showed much promise. One patient who failed to respond to Lugol's solution responded to penicillin. Resolution occurred in all but 1 of the early cases with either form of treatment, and abscess formation was more likely to develop in older cases of three or more days' duration before the start of therapy. Draining of abscesses is advised in conjunction with chemotherapy. Although 15 of the 49 patients died, in 13 of the 15 the parotitis had completely or partially resolved under chemotherapy without abscess formation before death occurred. The chief causes of death were the underlying primary diseases.

Resection of Duodenum and Head of Pancreas for Carcinoma.—Waugh and his co-workers point out that, largely because of the pioneering efforts of Whipple, a radical operation has been evolved for carcinoma in the region of the ampulla of Vater. This operation offers the patient a chance for cure not previously available. It consists in radical resection of the duodenum and head of the pancreas. The authors review 30 cases in which this operation was performed at the Mayo Clinic. The operative mortality in these cases was 20 per cent. The postoperative survival on short follow-up is disappointing in the cases in which the operation was done for carcinoma of the head of the pancreas but encouraging in those in which it was done for carcinoma of the ampulla of Vater. Although the one stage procedure is usually preferable, there is the occasional patient with severe damage to the liver who will require a two stage operation. Pancreaticojejunostomy, either end to end or end to side, has improved the prospect for normal nutrition postoperatively. Choledochojejunostomy usually is preferable to cholecystojejunostomy in the one stage procedure. Postcolic, antiperistaltic gastrojejunostomy made distal to the biliary and pancreatic anastomoses lends itself well to this type of resection and has proved most effective.

Thermal Burns: Effect of Altering Nitrogen and Caloric Intake or of Administering Testosterone Propionate.—Abbott and his co-workers summarize the impressions gained in studying the metabolic response of 45 burned patients and a group of animals with standardized experimental burns. This report is largely confined to the the effect on the nitrogen balance of altering the food intake or of administering daily 25 mg. of a nitrogen-retaining hormone (testosterone propionate). Following a thermal injury there is a fairly characteristic metabolic response, which is dependent on the severity of the injury and on the patient, his sex, age, previous nutritional state, therapy and complications. Diets with 3,000 to 5,000 calories and containing 100 to 300 Gm. of protein do not seem advantageous during the catabolic phase following a burn. In fact, such therapy seems to be harmful when given during the first week or two. Diets containing 1.6 times the basal caloric requirement (100 to 150 Gm. of protein) seemed to be tolerated quite well by the average patient. These patients had a smoother clinical course than did those on a higher intake; they maintained weight better and showed a smaller nitrogen loss than did the patients treated on a lower food intake. There is evidence that testosterone propionate may be of value in thermal injuries, although further investigation is necessary before such therapy can be advocated for routine use.

Texas State Journal of Medicine, Fort Worth

42:251-300 (Aug.) 1946

Cholesterol Levels in Various Diseases and Effects of Decholesterizing Agents. G. R. Herrmann.—p. 260.
Infectious Hepatitis. S. C. Arnett Jr.—p. 264.
War Wounds of Liver. G. F. Madding, K. B. Lawrence and P. A. Kennedy.—p. 267.
Treatment of Compound Fractures of Long Bones. H. Dudgeon Jr. —p. 273.
Use of Thromboplastin Fixation in Skin Grafting and Wound Healing. M. D. Heatly.—p. 275.
Outlook for Infants Receiving Anti-Rh Agglutinins from Isoimmunization of Mothers. A. Bloxsom.—p. 279.
Use of Fine Cotton Sutures in Episiotomy Repairs. W. S. Morse. —p. 282.
Simple Technic for Closure of Cataract Incision. R. K. Daily and L. Daily Jr.—p. 284.
Ulcerative Colitis with Perforation in Newborn: Case. J. A. Hart. p. 286.

United States Naval Med. Bulletin, Washington, D. C.

46:1159-1348 (Aug.) 1946. **Partial Index**

Rapid Method for Determining Methyl Alcohol in Blood and Body Fluids. E. E. Ozburn.—p. 1170.
Injection of Iodized Oil as Aid to Closure of Draining Sinuses. G. Crile Jr.—p. 1174.
*Tropical Acne. M. B. Sulzberger, E. F. Addenbrooke, S. J. Joyce, S. Greenberg and A. G. Mack.—p. 1178.
Bronchiectasis: Clinical Analysis of 39 Cases. J. J. Witt.—p. 1192.
Giardiasis: Question of Pathogenicity. H. A. Monat and W. L. McKinney Jr.—p. 1204.
Specific Gravity of Healthy Men: Report of 835 Cases. S. S. Sarkisian. —p. 1207.
Neuralgic Reflex from Impacted Lower Third Molar. S. J. Welborn. —p. 1212.
Pneumococcal Vulvitis and Vaginitis: Case. R. C. Forman.—p. 1214.
Prosthetic Restoration Following Gunshot Injury of Maxilla. H. E. Denen.—p. 1218.
Suggested Modification of Bogen Procedure for Determination of Alcohol in Body Fluids. J. J. Engelfried.—p. 1222.
External Otitis in Tropics. P. Ashley.—p. 1230.
Efficacy of Penicillin Ointments. J. A. Heinlein, C. C. Carpenter, A. Yaguda and Jean C. Wyse.—p. 1237.
Intradermal Tests with "Dirofilaria Immitis" Antigen as Diagnostic Aid in Human Filariasis. G. M. Saunders, A. A. Bianco and W. S. Jordan.—p. 1242.

Tropical Acne.—According to Sulzberger as high as 10 per cent of all patients in military hospitals on Guam had skin diseases and from 60 to 70 per cent of ambulatory patients had skin disorders. Analysis of dermatologic cases revealed that approximately 20 per cent of the dermatoses are acnes. This is the more astonishing in view of the observation that most cases of acne seen in temperate climates tend to improve during the summer and in warm weather. The authors present observations on 51 consecutive cases of acne studied on the island of Guam. Although furuncles and furunculoid lesions may be present, the characteristic lesions of acne dominate the picture. There are blackheads, papules, nodules, pustules, cysts and often scarring. Despite the basic similarity with acne vulgaris the condition differs from adolescent acne vulgaris in several significant respects, namely its age of onset, its principal localization and its course. It is brought on or made worse by heat and high humidity and tends to improve when patients are removed to a cool dry environment. While poor personal hygiene, diet, local factors and infection may play some role, the occlusion of the ducts of hyperactive sebaceous glands seems to be the essential pathologic process.

Virginia Medical Monthly, Richmond

73:301-346 (July) 1946

Compulsory Federal Sickness Insurance. W. B. Martin.—p. 303.
Diagnosis of Respiratory Allergy. M. Millman.—p. 309.
Spinal Anesthesia. C. H. Lupton Sr. and C. H. Lupton Jr.—p. 315.
Management of Adenomatous Goiters. R. M. DeHart.—p. 320.
Skin Test as Suggested Aid in Diagnosis of Salmonella Suipestifer: Case Report. J. S. Morris and M. G. Irons.—p. 324.
Primary Virus Mastitis from Mumps. C. Marshall Lee.—p. 327.
Spontaneous Passage of Open Safety Pin from Esophagus into Stomach with Point of Pin Directed Downward: Report of Case. P. P. Vinson.—p. 329.
Tension Pneumothorax from Rupture of Esophagus: Report of Case. W. E. Pembleton.—p. 331.

73:347-392 (Aug.) 1946

Disfigurements of Face. W. L. Gatewood.—p. 351.
Precautions in Administration of Sulfa Drugs. H. H. Howze.—p. 356.
Importance of Cerebrospinal Fluid Examination in Syphilis. L. W. McIlhany.—p. 360.
Pulmonary Actinomycosis Due to Actinomyces Asteroides. F. W. Shaw. —p. 362.
Use of Defibrinated Human Blood for Culturing Tubercle Bacillus. A. W. Bengston.—p. 369.
Surgical Lesions of Greater Omentum. E. M. Fusco.—p. 371.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

54:307-340 (Aug.) 1946

Obstruction Following Gastrojejunostomy: Its Biochemical Factors. J. H. Woolsey.—p. 307.
Delayed Healing of Abdominal Wound Due to Food Allergy. A. H. Rowe.—p. 313.
Thyrotoxicosis and Pregnancy. R. C. Stepto.—p. 317.
Pyogenic Infection of Spinal Epidural Space. R. M. Rankin and P. G. Flothow.—p. 320.
Prophylactic Treatment of Congenital Syphilis. H. Vignes.—p. 324.
Symposium on Use and Abuse of Bed Rest in Surgery, Urology, Orthopedics and Medicine. D. Mason, E. B. Speir, R. G. Wyrens, I. McLemore and J. J. Reilly.—p. 328.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Rheumatic Diseases, London

5:69-104 (March) 1946

Nature of Fibrositis: II. Study of Causation of Myalgic Lesion (Rheumatic, Traumatic, Infective). M. Kelly.—p. 69.
*Weltmann Coagulation Reaction in Rheumatoid Arthritis. O. Lucchesi, M. Lucchesi and S. Bailonie.—p. 78.
Formol-Gel Test on Plasma and Serum in Rheumatic Cases: Correlation Studies and Suggestion that Non-Rouleau Forming Pathologic Globulins May Be of Significance in Rheumatism. H. J. Gibson and R. M. Pitt.—p. 83.
*Necrobiotic Nodules of Rheumatoid Arthritis Type with Lipoid Deposition. E. Fletcher.—p. 88.
Fibrositis and B-Diethylaminoethyl Dehydrocholate. H. Coke.—p. 96.
Cold Reaction Test for Peripheral Vasomotor Disturbances in Rheumatism. A. Woodmansey.—p. 99.
Ankylosing Spondylitis. W. Tegner.—p. 103.

Weltmann Coagulation Reaction in Rheumatoid Arthritis.—The Lucchesis and Bailonie think that Weltmann's serum flocculation band has not been sufficiently investigated in rheumatic diseases. They made this test 200 times in 85 cases, 66 of which (180 reactions) were cases of rheumatoid arthritis. They found that the sensitivity of the Weltmann reaction was practically the same as that of the sedimentation rate, the Weltmann reaction being only 2.8 per cent below the sedimentation rate. During the active stage of rheumatoid arthritis the Weltmann reaction showed a narrowed flocculation band; during the resting periods the band was normal. In rheumatoid arthritis the narrowing of the flocculation band was not as noticeable as in rheumatic fever. It occurred only up to tube 4. In rheumatoid arthritis the prognosis was favorable in cases which showed a normal or enlarged band, and it was unfavorable in cases showing a narrowed band. A favorable or reserved prognosis may in certain cases be advanced several months earlier, on the basis of the Weltmann reaction, than when the sedimentation rate is taken as a guide. In the terminal stage of rheumatoid arthritis there is a tendency toward an enlargement of the flocculation band.

Nodules of Rheumatoid Arthritis.—Fletcher reports a case in which nodules made their appearance on the head, neck, chest, abdomen, upper part of the arms, forearms, wrists, hands and legs of a man aged 42 four and a half years after he contracted rheumatoid arthritis. Biopsies were made of four subcutaneous nodules. There was present in all four specimens an area of complete necrosis in the center of the nodules, which, in three of the specimens, was surrounded by a cellular band containing numerous foam cells and many multinucleated and foreign body giant cells. Surrounding this again was a partly degenerated connective tissue band which contained, in addition to well defined foam cells, numerous inflammatory cells. In the other nodule the cellular zone was composed of fibroblasts arranged in a palisade manner. The vessels in the nodules and in the neighborhood showed endoarthritis, mesoarthritis and periarteritis. Cholesterol was present in the necrotic areas and the surrounding tissues. Fletcher suggests that probably the best description of the apparently unique nodules would be "necrobiotic nodules of the rheumatoid arthritis type with lipoid deposition."

Archives of Disease in Childhood, London

21:61-120 (June) 1946

Pulmonary Agenesis and Hypoplasia. C. Elaine Field.—p. 61.
Fatal Case of Beriberi in Child in England. E. C. Allibone and H. S. Baar.—p. 76.
Penicillin and Sulfonamides in Treatment of Infections in Infancy. E. C. Ross.—p. 88.
Psychologic Aspect of Allergic Skin Reactions in Childhood. Barbara Woodhead.—p. 98.
Statistics of Prematurity: Plea for Standardization. J. L. Henderson.—p. 105.
Incidence of Congenital Pyloric Stenosis. G. Davison.—p. 113.
Dental Fluorosis. H. Sainsbury.—p. 115.
Pyocolpos in Infancy. I. P. Todd.—p. 118.

British Journal of Dermatology and Syphilis, London

58:147-212 (July-Aug.) 1946

Prospect and Retrospect: II. H. MacCormac.—p. 147.
Recurrent Aphthous Ulceration of Oral Mucous Membrane and Genitals Associated with Recurrent Hypopyon Iritis (Bechet's Syndrome): Report of 3 Cases. I. Katzenellenbogen.—p. 161.
*Myxedema Circumscriptum Thyrotoxicum. E. Lipman Cohen.—p. 172.
Dermatology in B. L. A. F. F. Hellier.—p. 183.

Circumscribed Thyrotoxic Myxedema.—Lipman Cohen reports a case of circumscribed myxedema in a man aged 35 with mild thyrotoxicosis manifested by exophthalmos, nervousness, tremor, sweating, palpitation and relative lymphocytosis. On the anterior aspect of both legs there were roughly rectangular, poorly demarcated, raised bluish thickenings with yellow discoloration surrounding the lesions. These thickenings contained poorly defined firm swellings. The follicles were prominent and there were large flat, irregular, shiny translucent papules. When a biopsy was performed, mucin oozed from the incision. Thiouracil 1.2 Gm. was given daily for three weeks; administration of this drug was continued with 0.6 Gm. daily for two weeks and with 0.4 Gm. daily for nine weeks. The patient gained 14 pounds (6.4 Kg.) and his nervousness and tremor disappeared. The exophthalmos had greatly decreased. Changes in the skin were slight. The blue and yellow coloration had disappeared and the swellings were considerably softer but slightly bigger. Thiouracil will not cure this condition even when it controls the thyrotoxicosis completely. The name "myxedema circumscriptum thyrotoxicum" is suggested for the condition as being accurately descriptive and not too unwieldy.

British Journal of Experimental Pathology, London

27:135-210 (June) 1946. **Partial Index**

Investigation Into Production of Bacteriostatic Substances by Fungi: Preliminary Examination of Fifth Hundred Species, All Basidiomycetes, Mostly of Wood Destroying Type. W. H. Wilkins.—p. 140.
*Renal Effects of Protein Deficient Vegetable Diets: Functional and Histologic Study. S. E. Dicker, H. Heller and T. F. Hewer.—p. 158.
Observations on Acidophil Cell Changes in Pituitary in Thyroxine Deficiency States: I. Acidophil Degranulation in Relation to Goitrogenic Agents and Extrathyroidal Thyroxine Synthesis. H. D. Purves and W. E. Grieshach.—p. 170.
Influence of Methylation on Carcinogenic Activity: I. N-Methyl-3:4:5:6-Dibenzcarbazole. A. H. M. Kirby and P. R. Peacock.—p. 179.
*Fecal Urobilinogen: Clinical Evaluation of Simplified Method of Estimation. N. F. Maclagan.—p. 190.
Some Observations on Blood Clotting Mechanism: Role of Fibrinogen and Platelets, with Reference to Case of Congenital Afibrinogenemia. J. L. Pinniger and F. T. G. Prunty.—p. 200.

Effect of Protein Deficient Diets on Rat Kidney.—Dicker and his associates investigated the kidney function of rats fed on vegetable diets that were deficient in protein. Kidney function tests were performed when the rats had been on protein deficient vegetable diets for about thirty-six days and when their plasma protein concentration had decreased from 7.58 ± 0.082 to 4.26 ± 0.097 Gm. per hundred cubic centimeters. Estimations of the total tubular excretory mass of rats on a protein deficient "turnip diet" gave figures which were significantly lower than those in normal rats, showing an impairment of the tubular diodone transfer mechanism. Urinary concentration and dilution tests revealed that the urine of rats on a standard diet reached a mean specific gravity of 1.070 ± 0.0037 after twenty-four hours of water deprivation. The same series of animals at the end of the period of protein deficient feeding excreted a urine of the mean specific gravity of 1.041 ± 0.0044. The results of the concentration and dilution tests are discussed with reference to the occurrence of visible edema in the animals on protein deficient vegetable diets and to the decreased water diuresis usually observed in hypoproteinemic rats. Renal lesions were found in many of the rats on protein deficient vegetable diets. They consisted of necrosis and calcification of the broad limbs of Henle; the glomeruli and other parts of the nephron showed no apparent change.

Estimation of Fecal Urobilinogen.—Maclagan treats fresh stool with ferrous hydroxide to convert stercobilin pigments to urobilinogen. The filtrate is heated with Ehrlich's reagent and sodium acetate, and the pink color is compared in either a photoelectric colorimeter or in a Duboscq type color-

imeter against a neutral gray screen. Estimations in 120 cases are recorded. A study of the various possible sources of error indicates the importance of testing only fresh specimens. Normal values were from 30 to 220 mg. per hundred grams or from 22 to 121 mg. per day if estimated on four consecutive twenty-four hourly collections. Results were above normal in retention jaundice, malaria, untreated pernicious anemia and aplastic anemia, after fractures of long bones and in certain cases of infective jaundice; they were below normal in many cases of infective and obstructive jaundice. The value of the test as an index of hemolysis is discussed. When used for this purpose it may be desirable to combine the estimation with reticulocyte counts and/or serum bilirubin estimations.

British Medical Journal, London

2:185-216 (Aug. 10) 1946

*Male Infertility. T. N. A. Jeffcoate.—p. 185.
Treatment of Carcinoma of Prostate by Perurethral Resection and Stilbestrol. H. T. Cox.—p. 191.
Outbreak of Smallpox in Middlesex. W. H. Bradley, J. O. F. Davies and J. A. Durante.—p. 194.
Case of Mercurial Poisoning and Its Treatment. R. H. Ellis.—p. 197.
Syndrome Known as "Reiter's Disease": Triad of Polyarthritis, Urethritis and Conjunctivitis. W. P. U. Jackson.—p. 197.

Male Infertility.—Of the 512 consecutive cases of sterility seen by Jeffcoate in private practice 491 were investigated, and assessment of the husband's fertility was made in 320 of these. In the hospital series the husband's fertility was assessed in 115 of the 252 cases studied. Not less than one third of the husbands of infertile marriages have impaired fertility. Of the husbands examined by semen analysis 40 per cent showed evidence of subfertility. Responsibility for one pregnancy is unreliable evidence of a man's fertility. Impotence existed in 13, phimosis preventing coitus in 1 and faults in semen in 169. Impotence is more often due to psychologic disturbance than to physical disability or endocrine upset. The treatment of impotence consisted essentially in talks and discussions with the object of sorting out the underlying cause of the inhibition, explaining it and giving instruction on sex matters. This treatment proved effective in some of the cases. Sublingual administration of testosterone was largely ineffective. The causes of defects in production or delivery of spermatozoa are mumps, cryptorchism, venereal disease, varicocele and endocrine imbalance. In about half of the cases none of these causes could be found, and in these many possible etiologic factors have been postulated such as nutritional deficiencies and constitutional, occupational and environmental factors. In the absence of an obvious cause the treatment of faulty production of spermatozoa is for the most part empirical. Attention to general health and habits, hours of work and recreation is always important. Some form of glandular therapy is usually advised. Semen analysis before and after treatment with serum gonadotropin in 14 cases showed that in the majority of cases the quality of the semen improves after treatment and that it deteriorates again when treatment is suspended. These results, although suggestive, are not conclusive, and the possibility of spontaneous variations in the semen cannot be excluded. In the assessment of male infertility arbitrary standards for the various characters of the semen have to be adopted. Attention is drawn to the need for caution in the interpretation of the results.

2:217-252 (Aug. 17) 1946

*Health of Children in Wartime Day Nurseries. Report of Investigation by the Day Nurseries Committee of the Medical Women's Federation, in Conjunction with W. J. Martin.—p. 217.
Aftermath of Perforated Peptic Ulcer. W. Houston.—p. 221.
Meningitis Due to Penicillin Sensitive, Sulfonamide Insensitive Pittman b Strain of Hemophilus Influenzae: Recovery. Constance F. Drysdale, D. G. McIntosh and J. Brodie.—p. 223.
Acute Enteritis in Subtropical Climates. I. MacGregor.—p. 225.
Overdosage with Bromides: Report of 59 Cases. E. C. Dax.—p. 226.

Health of Children in Wartime Day Nurseries.—The Nurseries Committee of the Medical Women's Federation compared children who had been six months or more on the register of a wartime day nursery (nursery group I) with two other groups: (*a*) children who had been less than one week in a day nursery (nursery group II) and (*b*) children attending welfare centers. Wartime day nurseries were established with the object of augmenting the country's labor force. Admission was therefore limited in the main to the children of mothers in employment. Children who had been on the register of a wartime day nursery for six months or more had a much higher incidence of respiratory infection than those attending welfare centers in the same localities. The difference was present in all age groups and in both sexes. The 2 to 3 year old groups showed the greatest difference. The increase in respiratory infection was not attributable to significant differences between welfare center and nursery children at the start of their nursery life. On the other hand, the data show that the nursery children were on the whole heavier than the welfare center ones. More nursery children were recorded as "very fit" and "well" in the upper age groups than in the same age groups of welfare center children. The scope of the evidence is admittedly limited, but as far as it goes it does not indicate a beneficial effect of nursery life for the younger children—rather the reverse. The conclusion is reached that the high incidence of respiratory infection in wartime day nurseries constitutes a risk to health demanding careful consideration in weighing the value of day nursery life.

2:253-286 (Aug. 24) 1946

Study of Peptic Ulcer. H. Gainsborough and E. Slater.—p. 253.
Breast Milk Bank in Maternity Units. Martha Dynski-Klein.—p. 258.
*Painful Feet Syndrome Among Prisoners of War in Far East. J. A. Page.—p. 260.
Facial Palsy Accompanying Acute Mastoiditis, with Comments on Chemotherapy in Acute Suppurative Otitis Media. K. R. Ogilvie.—p. 263.
Treatment of Pediculosis Capitis with DDT Emulsion. A. D. Frazer.—p. 263.

Painful Feet Syndrome.—Page directs attention to a condition known as painful, electric, hot or happy feet among prisoners of war in the Far East. It is ushered in by severe burning and aching of the feet associated with hyperesthesia, raised skin temperature and vasomotor changes in the feet, with general body wasting. The condition was first seen from three to five months after the Japanese occupation in the various countries in the Far East where large prison camps were established. No definite cause could be attributed at first, but protein, fat or vitamin deficiencies were considered as possible causes. A factor contained in grain was regarded as important when it was observed that men fed for months on rice with a rich admixture of barley did not develop painful feet, whereas their comrades fed on a poor grade of frequently musty rice did. The syndrome appears to be the result of a deficiency of factors in the vitamin B complex closely allied to the PP factor but primarily affecting the peripheral arteries of the lower extremities, or it might possibly be due to a toxic factor in old musty polished rice associated with a low protein intake and reduced vitality. The appearances in the early stages are similar to those of erythromelalgia. It is not an angioneurosis and is not associated with a neuropathic diathesis. The disease is amenable to treatment by replacement of the deficient elements in the diet; otherwise it is rapidly progressive, ending in death or serious crippling deformities.

Edinburgh Medical Journal

53:337-400 (July) 1946

Valedictory Address on "Can International Disputes be Settled Without War—and Will They?" W. J. Stuart.—p. 337.
Ligation of Ductus Arteriosus. A. R. Gilchrist.—p. 346.
Patent Ductus Arteriosus and Its Surgical Treatment. W. Mercer.—p. 355.
Tuberculosis Under a National Health Service: I. General Review. J. S. Westwater.—p. 360.
Id.: II. With Special Reference to Rural Areas. C. Clayson.—p. 371.
Value of Vitamin A Estimation in Blood. W. Tomaszewski and L. Dzialoszynski.—p. 379.
Effect of Arteriovenous Aneurysms on Blood Volume and Blood Picture. M. H. Roscoe and G. M. M. Donaldson.—p. 391.

Journal of Laryngology and Otology, London

60:461-520 (Dec.) 1945

Congenital Choanal Atresia. A. Durward, O. C. Lord and C. J. Polson.—p. 461.
Repair of Depressed Nasal Bridge. S. Suggit.—p. 501.
Wounds of Mastoid Process: (Report of 11 Cases). J. Magill.—p. 504.

Journal of Mental Science, London

92:497-666 (July) 1946

Clinical Survey and Results of 200 Cases of Prefrontal Leukotomy. J. Frank.—p. 497.
Experiment in Vocational Adjustments of Neurotic Patients. H. Halstead and P. Slater.—p. 509.
Generalized Xanthoma, with Case Presenting Lesion of Central Nervous System. C. E. H. Turner.—p. 516.
Social Maturity Test. F. Brodman.—p. 532.
Lasting Lessons of Overseas Military Psychiatry. S. A. MacKeith.—p. 542.
Mental Disorder in Adult Defective. J. C. Rohan.—p. 551.
Quaker Contribution to Psychiatric Thought and Practice. Gwendoline D. Knight.—p. 564.
Intracranial Aneurysm with Minimal Signs. A. Roberts.—p. 570.
*Study of Psychiatric Illness in Coal Miners. F. Post and M. B. Lond.—p. 574.
Psychiatric Casualties in Burma. E. Stungo.—p. 585.
Pain and its Underlying Pathology. G. F. Rowbotham.—p. 595.

Psychiatric Illness in Coal Miners.—Post and Lond report observations on 100 men employed in underground work in the mining industry who were treated at the Jordanburn Nerve Hospital. Anxious depressive psychoneurosis was observed in 30 patients, depressive psychosis in 18, persistent psychoneurosis including psychopathies in 14, organic psychiatric syndrome in 12, schizophrenic psychosis in 11, conversion hysteria in 10 and physical disease accompanied by psychiatric symptoms in 5. In more than half of the miners suffering from a psychiatric illness occupational factors were absent or unimportant from the point of view of etiology, and only few men broke down on account of the unpleasant and dangerous nature of underground work alone; on closer investigation deeply seated personality problems eclipsed in importance the occupational factor. The author thinks that observations made on psychologically ill men cannot be applied to miners as a group. There are the stabilizing factors of a corporative spirit and, especially in the face of danger, miners show a fine sense of comradeship. Yet there is also an atmosphere of disgruntled resentment and restiveness, which must provide a favorable culture medium for neurotic reactions.

Journal of Physiology, Cambridge

104:353-448 (April) 1946. **Partial Index**

Renal Action of Posterior Pituitary Extract and Its Fraction as Analyzed by Clearance Experiments on Rats. S. E. Dicker and H. Heller.—p. 353.
Temperature and Blood Flow in Human Forearm. H. Barcroft and O. G. Edholm.—p. 366.
Normal Visual (Rod) Field of Dark-Adapted Eye. Ida Mann and F. W. Sharpley.—p. 384.
Stimulating Action of Acetylcholine on Heart. R. J. S. McDowall.—p. 392.
Normal Variations in Blood Hemoglobin Concentration. A. Brown and A. L. Goodall.—p. 404.
Properties and Distribution of Enzyme System Which Synthesizes Acetylcholine in Nervous Tissue. W. Feldbert and T. Mann.—p. 411.
Circulatory Changes During Fainting and Coma Caused by Oxygen Lack. D. P. Anderson, W. J. Allen, H. Barcroft, O. G. Edholm and G. W. Manning.—p. 426.
Effect of Ethyl Alcohol and Some Other Diuretics on Chloride Excretion in Man. M. Grace Eggleton and Isabel G. Smith.—p. 435.
Osmotic Pressure of Human Fetal and Maternal Serums. E. F. McCarthy.—p. 443.

Lancet, London

2:221-256 (Aug. 17) 1946

Penicillin Inhalation in Pulmonary Disease. J. H. Humphrey and H. Joules.—p. 221.
Inhaled Penicillin in Bronchial Infections. N. Southwell.—p. 225.
*Casein Hydrolysate: Supplementary Food for Premature Infants. J. E. Jorpes, J. H. Magnuson and A. Wretlind.—p. 228.
Acute Abdominal Lymphadenitis in Children. Alfreda H. Baker and Ursula James.—p. 232.
Artificial Pneumoperitoneum: As Emergency Measure in Severe Hemoptysis. A. J. Benatt.—p. 234.
Poisoning by DDT Emulsion: Report of Fatal Case. K. Biden-Steele, and R. E. Stuckey.—p. 235.
Tropical Eosinophilia in Egypt: Report of Case. E. Stephan.—p. 236.
Renal Pathology in Light of Recent Neurovascular Studies. J. Trueta, A. E. Barclay, P. Daniel, K. J. Franklin and M. M. L. Prichard.—p. 237.

Casein Hydrolysate for Premature Infants.—Jorpes and his associates gave a mixture of amino acids, an enzymic casein hydrolysate, as a supplement to breast milk to over 100 premature infants. Usually the daily dose was 2.5 Gm. of amino acids per kilogram of body weight, together with an equal amount of dextrose. The infants tolerated the amino acid mixture well. There were no signs of digestive disturbance. The feeding of this mixture of amino acids produced in every instance a distinctly higher gain in weight than breast milk alone. A comparison between the effects of this amino acid mixture and of a mixture containing undigested casein, dextrose and salts in the same strengths and proportions proved that the gain in weight was consistently greater during the periods when the infants were receiving amino acids than when casein was being administered. By special tests, in which neither dextrose nor salt mixture was added to the diet, it was demonstrated that the gain in weight was due to the amino acids. The results achieved indicate that by administering this supplementary food it is possible to shorten the hospital stay of these infants.

2:257-292 (Aug. 24) 1946

Serious Psychiatric Disability Among British Officers in India. R. F. Tredgold, H. N. Heffernan, G. Kelly and P. R. W. Leigh.—p. 257.
Vitamin A and Skin Disease. Z. A. Leitner and T. Moore.—p. 262.
Stabilization of Penicillin Solutions with Phosphate. R. J. V. Pulvertaft and J. Yudkin.—p. 265.
*Syndrome Simulating Acute Abdominal Disease. B. W. Goldstone and H. S. LeMarquand.—p. 267.
Sporotrichosis Resembling Diphtheria: Report of Unusual Case. H. S. Banks.—p. 270.
*Peptic Ulcer Treated with Gastric and Intestinal Extracts. O. Hubacher.—p. 272.

Syndrome Simulating Acute Abdominal Disease.—Goldstone and Le Marquand describe a series of cases in which the symptomatology indicated an acute abdominal condition. There was right upper abdominal pain and rigidity with pyrexia. The syndrome comes on in a few hours and frequently simulates a perforative lesion. Spontaneous recovery is the rule. In 1 of the 13 cases observed a perirenal abscess eventually developed. It is suggested that the cases in which spontaneous recovery occurred were abortive forms of perirenal staphylococcic infection. Abortive perirenal staphylococcic infection may be common in the silent perirenal fat, but symptoms do not arise unless the lesion touches the peritoneum. Cases simulating perforated peptic ulcer but negative on operation are not uncommon. They may be of the same type as those described here.

Gastric and Intestinal Extracts in Peptic Ulcer.—According to Hubacher enterogastrone, extracted from the intestinal mucosa, diminishes gastric secretion, decreases gastric motility and participates in the regulation of the blood supply to the gastric and duodenal mucosa. It largely prevents the development of the intestinal ulcers in dogs subjected to duodenoileac anastomosis and gastrojejunostomy. Urogastrone is a substance analogous to enterogastrone obtained from urine; it is found in decreased quantity in the urine of ulcer patients, and it has been assumed to represent an excretory form of enterogastrone. Independently of results obtained in the United States, extracts have been prepared in Switzerland from the stomach and small intestine of freshly slaughtered animals. The water soluble part of the extract is used for injection, and the water insoluble fraction is put up in tablets. The preparation for the treatment of gastric ulcer contains predominantly extract of stomach, whereas that for the treatment of duodenal ulcer contains principally extract of small intestine. Of 54 cases treated with these extracts 44 showed good results. All the cases which benefited by this treatment showed rapid disappearance of symptoms, increase in weight and rapid decrease in size of the ulcer niche as disclosed by radiography. These results were obtained without dietetic restriction or confinement to bed. It is suggested that the extract in tablet form can be used to supplement the injections or for prophylactic treatment.

Tubercle, London

27:81-104 (July) 1946

Basal Pulmonary Tuberculosis, with Special Reference to Etiology and Treatment. F. S. Hawkins and G. O. Thomas.—p. 82.
Changing Chest Clinic. P. Ellman.—p. 88.
Improved Stain for Fluorescence Microscopy. G. C. Huges.—p. 91.
Hematologic Study in Pulmonary Tuberculosis and Effect on It of Large Doses of Vitamin C. M. N. Rudra and S. K. Roy.—p. 93.
Artificial Anterior Pneumomediastinum in Treatment of Hemoptysis. J. M. Velasco.—p. 95.
National Scheme for Rehabilitation of the Tuberculous. F. R. G. Heaf, P. Edwards, J. B. McDougall and A. C. Tibbits.—p. 97.

Presse Médicale, Paris

54:373-384 (June 8) 1946

Tuberculin Cutireaction and Granulodiagnostic. R. Benda and D. A. Urquia.—p. 373.
*Aninsulin. P. Barral.—p. 374.
Aleukia Resulting From Ingestion of Toxic Food: New Disease Described in URSS. L. C. Brumpt.—p. 375.

Aninsulin.—Barral produced aninsulin by exposing insulin to the combined action of heat and formaldehyde. Administration of aninsulin to rabbits, horses and human subjects revealed that aninsulin in concentration of 2 cc. in 1 liter of isotonic solution of three chlorides to 10 cc. per thousand is a vasoconstrictor, while insulin in a concentration of 2 cc. per liter is a vasodilator and becomes a vasoconstrictor only with much higher concentration. Aninsulin is not hypoglycemic and is not toxic. It retains the trophic power of the insulin. One injection of 0.2 to 0.5 cc. of aninsulin every two days proved sufficient to stimulate cicatrization of indolent postoperative wounds and of ulcers of the leg. Aninsulin increases the complement power of serum and has a pronounced antigenic power. A true Arthus phenomenon was produced in rats with Jensen's sarcoma by injection of aninsulin. The existence of an antibody "antianinsulin" was demonstrated in the serum of certain patients with cancer.

54:461-472 (July 13) 1946

*Severe Anemia Resistant to Hepatotherapy and Cured with Yeast. J. Olmer and H. Sarles.—p. 461.
Sternal Puncture and Toxic or Pathologic Granulations of Marrow Cells in Chronic Tuberculosis of Lungs. L. Béthoux.—p. 462.
Enuresis and Urinary Rhythm. R. Lacassie.—p. 462.

Severe Anemia Cured with Yeast.—Olmer and Sarles report 2 cases of severe anemia in 2 men aged 64 and 40. Both patients presented severe hypochromia, megaloblasts in the bone marrow but not in the blood, precocious or secondary absence of free hydrochloric acid in the gastric juice after histamine, glossitis, and diarrhea. Daily injections of 100 to 120 Gm. of liver extract proved ineffective. Rapid improvement and complete recovery resulted from the administration of 2 to 3 table spoons of fresh yeast daily for two to three months. The spectacular effect of the yeast therapy in these 2 cases opens new possibilities for this method of treatment in severe anemia.

Semaine des Hôpitaux de Paris

22:1209-1272 (July 14) 1946. **Partial Index**

Present State of Clinical Electroencephalography. A. Baudouin.—p. 1209.
*Electroencephalographic Diagnosis of Epilepsy. A. Baudouin, H. Fischgold and A. Rémond.—p. 1217.
Effect of Lobeline on Electroencephalogram of Epileptic Patients. L. Bugnard, J. Planques, F. A. Grezes-Rueff and C. Grezes-Rueff.—p. 1225.
*Electroencephalography of Brain Tumors. H. Baudouin, H. Puech, H. Fischgold and A. Lerique-Koechlin.—p. 1226.
Clinical and Medicolegal Utilization of Electroencephalography in Late Craniocerebral Trauma. P. Puech, H. Fischgold, G. Verdeaux and J. Verdeaux.—p. 1233.
Electroencephalography in Carbon Monoxide Poisoning. J. Ajuriaguerra and H. Fischgold.—p. 1242.
Electroencephalographic Study of Comatose States. H. Fischgold and G. Bounes.—p. 1245.
Analysis of Cerebral Frequencies. L. Bugnard.—p. 1247.

Electroencephalographic Diagnosis of Epilepsy.—Baudouin and his associates state that specific paroxysmal patterns in the electroencephalogram, such as alternating wave-spike complex, solitary spikes or sudden and transient spikes, are suggestive of epilepsy. Paroxysmal irregularities consisting of a sudden emission of more or less symmetrical sinusoidal slow waves make epilepsy very likely in persons with attacks in the absence of other neuropsychic symptoms. Definite deviations from the normal electroencephalogram may be present hours and days after a clinical paroxysm. A favorable prognosis may be made on the simultaneous disappearance of these encephalographic changes and of the clinical symptoms as a result of adequate treatment, while prognosis is uncertain in cases in which the encephalographic changes persist in the absence of clinical symptoms. Normal electroencephalograms were observed in 20 per cent of persons with established diagnoses of epilepsy, particularly in persons of advanced age, in secondary epilepsy and in persons in whom the electroencephalograms were made a long time after the epileptic attack. The diagnosis of epilepsy is uncertain in a young untreated person presenting a grand mal attack but whose electroencephalogram made a few hours after the attack is normal. Only in persons over 20 years of age does the electroencephalogram assume its definite adult character. Before this age many persons may still present the infantile type of the electroencephalographic record. In the latter cases electroencephalograms should be interpreted with utmost caution with regard to the diagnosis of epilepsy.

Electroencephalography of Brain Tumors.—Baudouin and his associates studied electroencephalograms of 113 cases of brain tumor which were confirmed by ventriculography, surgical intervention or necropsy. Sixty-four of these were tumors of the hemispheres. The exact site of the tumor was demonstrated in 34 and the hemisphere involved was demonstrated in 9. A more or less definite localization has been possible in 67 per cent of the cases. The encephalogram proved inadequate in 6 cases, diffuse generalized electrical changes prevented the localization of the tumor in 9, normal electroencephalograms were observed in 3, while in 3 cases the localization of the tumor was erroneous. In the absence of clinical symptoms the electroencephalogram provides important information in cases in which the right temporal or the frontal lobes ("silent zones") are the site of the tumor. Electroencephalography may replace cerebral ventriculography in a limited number of cases in which the electrical observations correspond to the clinical symptoms. The electroencephalogram is of prognostic value with regard to immediate prognosis and the postoperative course. In 21 cases of tumor of the base the value of the electroencephalogram was inferior to that of the roentgenologic and ophthalmologic examinations. In 26 cases of tumor of the posterior fossa the electroencephalogram was of considerable prognostic value. A totally altered electroencephalogram in which the alpha rhythm has disappeared suggests a grave disturbance in the brain and an unfavorable prognosis with regard to surgical intervention.

Schweizerische medizinische Wochenschrift, Basel

76:477-502 (June 1) 1946

*Endocrinology of Tumors of Adrenal Cortex: Clinical Identity of Cushing Syndrome in Pituitary Basophilism and in Tumor of Adrenal Cortex; Crooke's Cells; Diabetes Insipidus in Cushing's Syndrome; Comment on Pathogenesis. H. Büchler.—p. 477.
Nitrose Gas Intoxications in Welders. F. Hatt.—p. 483.
Mode of Action of Adrenal Cortex Extract in Histamine Shock. T. Doby.—p. 485.
Intoxication and Detoxication in Animals. W. L. Lipschitz.—p. 486.
*Chemically Detoxicating Action of Sulfonamides an Apparently Disregarded Characteristic: Preliminary Report. P. Robert and V. Stettler.—p. 488.
Prophylaxis with Sulfonamides in Obstetrics. H. Aeppli.—p. 490.

Endocrinology of Tumors of Adrenal Cortex.—The observation of an endocrinologically active hypernephroma with Crooke's hyaline change in the pituitary basophils and with diabetes insipidus gave Büchler the opportunity to call attention to the clinical identity of Cushing's syndrome in hypophysial basophilism and in tumors of the adrenal cortex. Differentiation between basophilic adenoma and interrenalism is impossible on the basis of the clinical characteristics, except that hypertrophy of the clitoris and severe hirsutism is more characteristic of hypernephroma. The author describes the peculiar changes in the pituitary basophils described by Crooke in 1935 and stresses their significance as the only anatomic change in the endocrine apparatus that is found in all forms of Cushing's syndrome. He points out that the demonstration of diabetes insipidus by Redlich and by himself represents an extension of the symptomatology of hypernephroma, but the pathogenesis of the hypernephrogenic disturbance in the water exchange has not been explained as yet. A hypophysial-diencephalic genesis is considered possible, but in view of the simultaneously existing osteoporosis, nephrocalcinosis and hyperplasia of the parathyroids the possibility of a parathyrogenic diabetes insipidus is taken into consideration.

Detoxicating Action of Sulfonamides.—Robert and Stettler, observing that arsphenamine erythrodermia rapidly improves under sulfonamide treatment, suggested that in analogy to the sulfur therapy of toxicodermias the sulfur component of the sulfonamides may have a detoxicating effect. Since they were unable to find reports on this problem, they decided to investigate this assumed effect of sulfonamide compounds on the basis of the well known example of the detoxication of potassium cyanide by sulfur with formation of rhodan. It is well known that sodium thiosulfate, which readily splits off sulfur, is the best detoxicating agent in potassium cyanide poisoning. The authors made experiments on rabbits, administering the poison as well as a detoxicating sulfonamide preparation by intravenous injection. A decided protective action was exerted by the sulfonamide. It is believed that the detoxication takes place by way of rhodan formation. Sulfur probably plays an important part in the new chemotherapeutics and antibiotics.

Arch. Urug. de Med., Cir. y Especial., Montevideo

28:221-326 (March) 1946. **Partial Index**

*Treatment of Gastric and Duodenal Ulcers with Female Sex Hormones. W. Friedlaender.—p. 231.
Cancer of Stomach: Clinical and Radiologic Considerations. M. A. Bellini.—p. 242.
Penicillin in Treatment of Syphilis. J. M. Tiscornia Denis.—p. 254.

Female Sex Hormones in Gastric and Duodenal Ulcers.—Friedlaender reports 5 cases of gastroduodenal ulcer in which he resorted to the use of female sex hormones. He gives his patients two weekly injections of 2.5 mg. of diethylstilbestrol or of 5 mg. of estrogenic substance for three weeks. After the sixth injection he gives one weekly injection for an additional period of four weeks. The pain is usually favorably influenced after the fifth or sixth injection. If there is no improvement after ten injections the treatment must be regarded as a failure. Some patients may have a slight swelling of the mammary glands and others may have temporary impotence, but both of these effects subside after treatment is stopped. The diet needs to be much less strict when estrogens are given than is the case in the classic Sippy treatment. It may include soups, purées, potatoes, vegetables, chicken, sweets, honey, compotes and the like. As a result of this more generous diet the patient's general condition is better, his weight increases and he has a better appetite.

Prensa Médica Argentina, Buenos Aires

33:1109-1166 (May 31) 1946. **Partial Index**

*Penicillin in Empyema Following Pulmonary Exeresis: Prophylactic and Curative Value in 203 Cases. L. Langer, E. Naclerio and F. E. Tricerri.—p. 1140.

Penicillin in Prevention and Therapy of Empyema Following Resection of Lung.—Two hundred and three patients with pulmonary disease (bronchiectasis, cancer, tuberculosis and chronic suppuration) were subjected to partial or complete lobectomy or to pneumonectomy. In 100 patients 10 or 15 Gm. of sulfonamide was placed in the pleural cavity during the operation. One hundred and three patients received preoperatively intramuscular injections of 15,000 units of penicillin every three hours up to a total daily dose of 120,000 units for a period of from two days to two weeks, during which the patients were also given inhalations of penicillin solution in a dose of 20,000 units every three hours up to a total daily dose of 100,000 units. They also received intramuscular injections of penicillin after the operation for one or two weeks. Empyema developed in 13 per cent of the patients treated with sulfonamide and in 13.6 per cent of those given penicillin. These patients were treated with intrapleural administration of penicillin in daily doses of 40,000 units. Pulmonary empyema complicated pneumonectomy in 17.2 per cent, segmental resection in 40 per cent and lobectomy in 2 per cent. In empyema following pneumonectomy, penicillin was administered for as long as the pleural secretion was serosanguineous. As soon as the fluid became purulent, surgical drainage was resorted to. Empyema after resection of the lung seems to be dependent on the failure of the bronchial stump to close.

Revista Clinica Española, Madrid

21:195-282 (May 15) 1946

Psychosomatic Pathology and Internal Medicine. J. Rof Carballo.—p. 195.
Effect of Variations in Filling of Lesser Circulation on Pulmonary Volume and Elasticity: Latest Experimental Demonstration of Therapy on Mechanism of Asthmatic Crisis. C. Jiménez-Díaz, E. Arjona, J. M. Alés, F. Grande, E. López García and J. C. Oya.—p. 207.
New Syndrome of Ulcerating Hodgkin's Disease of Lungs. H. J. Castro Mendoza.—p. 213.
*Action of Nicotinic Acid on Gastric Secretion in Normal and Pellagrous Persons and in Other Forms of Achylia. M. Díaz-Rubio, E. Monsálvez and J. M. Masaguer.—p. 216.
Psychic Provocation and Psychogenic Manifestations in Patients with Extrapyramidal Disorders. A. Escudero Ortuño.—p. 220.
Physicochemical Foundations of Phenomena of Allergy and Immunity. J. L. Alvarez Sala.—p. 224.

Nicotinic Acid and Gastric Secretion.—Díaz-Rubio and his associates say that in treated pellagrous subjects they observed no improvement in secretion, achlorhydria remaining as before. In investigations on the action of nicotinic acid they found that the intravenous injection of nicotinic acid produces an increase of free acidity in the gastric juice in normal subjects, and in sufferers from achylia it causes the appearance of acidity. In achylia of pellagra no effect on the acidity is produced but only an increase in the quantity of the gastric juice. The authors think that this action of nicotinic acid is due to the greater vascularization it produces in the walls of the stomach, which in turn stimulates the secretory glands of the stomach. In patients with pellagra, however, the tonus of the sympathetic is lowered, and it is this factor which may explain the lack of response to nicotinic acid in these cases.

Nordisk Medicin, Gothenburg

30:973-1036 (May 3) 1946

Skin Reaction to Cold and Mechanism of Injuries from Cold. L. Kreyberg.—p. 973.

Hospitalstidende

Isolated Fracture of First Rib. A. Friese-Christiansen.—p. 977.
*Pyoderma Gangrenosum. H. K. Kristiansen.—p. 980.
Clinical Experiences with Methylthiouracil Treatment of Thyrotoxicosis. K. Lundbaek.—p. 982.

Finska Läkaresällskapets Handlingar

Epidemic of Field Fever (?) in Finnish Lapland. H. Hortling.—p. 1001.
Experiences in Operations for Habitual Luxation of Humerus. H. Hublin.—p. 1004.
Hemolytic Anemia of Lederer Type in Gastric Cancer with Metastases to Bone Marrow. L. E. Tötterman.—p. 1006.

Norsk Magasin for Laegevidenskapen

Hemoglobin Values in Norwegian Refugees on Arrival in Sweden. B. Kaada.—p. 1013.
Standard Metabolism Values During Food Crisis in Norway 1942-1943. D. Elstad.—p. 1019.
Apicitis, Inflammation of Apex of Petrous Portion of Temporal Bone. T. Leegaard.—p. 1023.
Gastric Ulcer: Penetration of Heart; Death from Rupture of Heart. A. S. Johannessen.—p. 1029.

Hygeia

X-Ray Control of Positive Miniature Radiography Cases. R. Lundström.—p. 1031.
Contribution to Diagnosis of Trichlorethylene Intoxication. S. Forssman and A. Ahlmark.—p. 1033.

Pyoderma Gangrenosum.—Kristiansen describes a rare disease which appears as a rapidly advancing gangrene of the superficial layers of the skin, with central necrosis, granulation tissue and intervening epithelial islands and peripheral undermining of the epidermis. It is accompanied with hypochromatic anemia and increased sedimentation reaction. The general condition is as a rule unimpaired. The regional lymph nodes are not affected. The disorder seems to predominate in women of ages between 16 and 60, and the duration is usually from nine to over twelve months. To date only 1 fatal case has been reported. If the course is not threatening, conservative treatment with sulfathiazole locally and by mouth is advised. In the personal case described there were dilated lymph vessels partly covered with epithelium derived from the surface epithelium.

Book Notices

Enzymes and Their Role in Wheat Technology. Edited by J. Ansel Anderson. American Association of Cereal Chemists, Monograph Series, Volume I. Cloth. Price, $4.50. Pp. 371, with illustrations. New York: Published by Interscience Publishers, Inc., for the American Association of Cereal Chemists, 1946.

The per capita consumption in the United States of the milled products of wheat is about 160 pounds each year. The principal converted products of wheat are bread and other bakery products. For more than twenty years it has been recognized that the enzymes which naturally occur in wheat have a significant effect on the baking characteristics of the flour. It is appropriate, therefore, that the first volume in the series of scientific monographs now being sponsored by the American Association of Cereal Chemists should be concerned with the enzymes of this important basic food.

The volume is divided into eleven chapters, the first of which, by W. M. Sandstrom, comprises a general discussion of the chemistry of enzymes. C. H. Werkman discusses the mechanism of alcoholic fermentation, and the subject of yeast fermentation is adequately handled by Lawrence Atkin, A. S. Schultz and C. N. Frey. The remaining chapters are concerned with amylases, esterases, oxidizing enzyme systems and proteases. Each of these subjects is discussed first from the general point of view and then from the point of view of its application to milling and baking technology. This division is a happy one because it permits a well rounded treatment. Thus, Mary L. Caldwell and Mildred Adams present a general review of the significance of amylases in plant and animal tissues. The application of the amylases in milling and baking technology is handled by Eric Kneen and R. M. Sandstedt. Herbert E. Longenecker contributes a chapter on esterases, and Betty Sullivan a chapter on the relation of esterases to milling and baking. In a remarkably brief section E. S. Guzman Barron presents a fairly comprehensive summary of current information about oxidizing systems, while Betty Sullivan reviews the scattered information about oxidizing enzyme systems of wheat and flour. Proteases are discussed by A. K. Balls and Marion W. Kies. The role of proteases in baking is treated by F. C. Hildebrand. Each chapter concludes with a selected bibliography. The book is adequately indexed as to both subjects and authors.

There is thus produced a well rounded volume that should be of interest and value to biochemists generally as well as to investigators in the field of enzymes and in the science of milling and baking. The cereal chemists are to be commended for having so successfully inaugurated a worth while program of sponsoring authoritative monographs in the science and technology of an important class of foods.

Advancing Fronts in Chemistry. Volume II. Chemotherapy. Edited by Wendell H. Powers, Assistant Professor of Chemistry, Wayne University, Detroit. Contributors: William H. Feldman and others. A Series of Lectures Sponsored by Wayne University under the direction of Neil E. Gordon, Chairman, Department of Chemistry. Cloth. Price, $3.25. Pp. 156, with illustrations. New York: Reinhold Publishing Corporation, 1946.

This volume is the second in a series of lectures delivered by competent authorities at Wayne University under the direction of Dr. Neil E. Gordon, chairman of the department of chemistry. The first volume consisted of lectures in the field of high polymers. The present volume includes lectures presented in 1945 by six writers on various phases of chemotherapy. Unfortunately, the lecture on antibiotics delivered by Dr. H. E. Carter of the University of Illinois is not included.

The first lecture, on chemotherapy in experimental tuberculosis, by Dr. William H. Feldman of the Mayo Foundation, is an excellent survey of the field. Dr. Feldman, in critical fashion, expresses the difficulties encountered in interpreting experimental and clinical results in the therapy of tuberculosis. The second lecture is a highly technical consideration of synthetic antispasmodic drugs by Dr. Frederick F. Blicke of the University of Michigan. Dr. E. H. Northey of the American Cyanamid Company presents an informative discussion on the chemistry of the sulfonamide drugs. The antimalarial problem is the timely subject considered by Dr. Harry S. Mosher of Pennsylvania State College, and Dr. C. Kenneth Banks of Parke, Davis & Company chose as his subject organometallic compounds as chemotherapeutic agents. The series concludes with a consideration of past developments and present needs in the chemotherapy of parasitic diseases, by Dr. Willard H. Wright of the U. S. Public Health Service.

The volume is well edited. Each of the chapters is preceded by a bibliographic sketch of the lecturer and succeeded by references to the literature. An excellent index concludes the volume. This series of informative lectures should be a welcome addition to the library of the physician who wishes to keep abreast of the newer developments in the field of medicine.

Psychological Medicine: A Short Introduction to Psychiatry, with an Appendix on Psychiatry Associated with War Conditions. By Desmond Curran, M.B., F.R.C.P., D.P.M., Psychiatrist and Lecturer in Psychological Medicine, St. George's Hospital, London, and Eric Guttmann, M.D., M.R.C.P., Neuropsychiatric Specialist, Emergency Medical Service, London. Foreword by J. J. Conybeare, M.C., D.M., F.R.C.P. Second edition. Cloth. Price, $3.50. Pp. 246, with 20 illustrations. Baltimore: William Wood & Company, 1945.

In the past year there have appeared a number of small manuals on psychiatry which have had considerable worth not only to the psychiatrist but to the physician who is interested in psychologic problems, particularly psychosomatic medicine. The authors of the present book are highly qualified British practitioners who have made contributions before. It is natural that since there are less than 250 small pages the subject cannot be covered completely. For physicians in this country it must be considered inferior to several American books on neuropsychiatry. The problem, for instance, of anxiety neurosis is not very well covered, while the psychoses are discussed in considerable detail. Some organic entities are completely neglected. The British slant is slightly different from ours: there is less emphasis on strictly freudian psychology, and the present authors have a definitely organic slant on certain conditions, such as neurasthenia, which has not been emphasized here. The book is too small for adequate discussions of shock treatment and psychotherapy. It is a substantial book from the standpoint of honest effort, and except for the differences which must occur between nations even in scientific subjects, and except for the need for cutting down information by virtue of its size, it can well be considered an adequate small psychiatric textbook.

Spezielle chirurgische Therapie für Studierende und Ärzte. Bearbeitet von Dr. Max Saegesser. Sammlung medizinischer Lehr- und Handbücher für Ärzte und Studierende. Band II. Cloth. Price, 80 Swiss francs. Pp. 884 with illustrations. Bern: Hans Huber, 1946.

As the title indicates, this is a manual of surgical treatment. Without discussing pathology or diagnosis, it tells what should be done in each specific surgical condition described, and how it is best to do it. The technic, preoperative and postoperative management, the possible pitfalls and how to avoid them are described in step by step detail. The work is up to date, written in clear and simple language, easily understood and followed by students for whom it is intended. The subjects covered in some of the twelve chapters are surgical treatment of diseases of the head, scalp and face and diseases of the chest, the abdomen and the urinary and genital organs. Also covered are injuries and diseases of the bones, joints and spine, as well as those of the blood vessels and peripheral nerves. In the belief that more can be learned from pictures than from words, there are numerous descriptive pen and ink illustrations, which greatly enhance the clarity and value of the text. This book is an excellent and useful addition to the surgical textbooks on this subject.

The Common Sense Book of Baby and Child Care. By Benjamin Spock, M.D. Cloth. Price, $3. Pp. 527, with illustrations by Dorothea Fox. New York: Duell, Sloan and Pearce, 1946.

The popular literature on child care has undergone a remarkable improvement in the past decade. From the dogmatic instructions to bewildered mothers on how to bathe, dress and prepare a complicated formula for the infant of a generation ago, recent publications have shown almost uniformly a more logical tendency with emphasis on understanding of principles rather than on exhortations to follow routine directions. There are today many such books on the market written mostly by pediatricians and psychologists, each giving his views in behalf

of better care of the infant and child. The common objective is to make child rearing free from unnecessary anxieties and at the same time cultivate a generation of happier, if not wiser, people.

Apparently with this aim Spock developed the theme of his book. He has incorporated the experiences of a sensible pediatrician into a volume which is an excellent treatise on the subject. Unlike many authors who are inclined to overemphasize some pet subject in which they happen to be most interested at the moment, Spock's pet subject seems to be the child as a whole unit. And as he is attempting to afford the child the benefits of wholesome care, he talks plain common sense to all who constitute the child's social and biologic setting from its earliest embryonic development through adolescence.

The style is simple yet thoroughly informative. The author does not indulge in speculative discussions. He has the happy ability of stating a point, developing it sufficiently to be understood by any person with normal intelligence, then proceeding to the next topic and the next, and so on. The subject matter is well organized. Throughout there is a palpable effort to interpret the child to a world of grown-ups. A most laudable feature in this connection is the discussion of the various phases of health and its possible aberrations at different age levels. The advantages of this arrangement are obvious. It not only affords parents an idea on what they may expect at a particular developmental level but also gives them the opportunity to familiarize themselves with the problems of immediate interest to them.

The advice "If you cannot get a doctor" and "consult your doctor" appears too frequently and is cumbersome and unnecessary. As a general rule people who read books of this type seldom rely on self medication. With the exception of this minor criticism, the book is by far the most instructive as well as the most practical in its field. It may be heartily recommended not only to parents but to physicians as well. Dr. Spock is to be congratulated on a difficult task exceptionally well accomplished.

Studies in Brazilian Anophelines from the Northeast and Amazon Regions. I. An Illustrated Key by Adult Female Characteristics for the Identification of Thirty-Five Species of Anophelini, with Notes on the Malaria Vectors (Diptera, Culicidae). By L. M. Deane, O. R. Causey and M. P. Deane. II. An Illustrated Key by Male Genitalic Characteristics for the Identification of Thirty-Four Species of Anophelini, with a Note on Dissection Technique. By O. R. Causey, L. M. Deane and M. P. Deane. III. An Illustrated Key by Larval Characteristics for the Identification of Thirty-two Species of Anophelini, with Descriptions of Two Larvae. By M. P. Deane, O. R. Causey and L. M. Deane. The American Journal of Hygiene Monographic Series, No. 18, February 1946. The publication of this monograph (No. 18) was financed by the Office of InterAmerican Affairs. Cloth. Price, $1.10. Pp. 58, with illustrations. Baltimore: Johns Hopkins Press, 1946.

This monograph consists of keys for species of Anopheles mosquitoes, both malaria carriers and those of no importance in the transmission of malaria. The malaria vectors represented are Anopheles gambiae, Anopheles aquasalis and Anopheles darlingi. The first part is devoted to the adult female characteristics of thirty-five species, the second part to the male genitalic characteristics of thirty-four species and the third part to the larval characteristics of thirty-two species of Brazilian Anophelini. The keys are accompanied with numerous drawings and photographs of the characteristics most needed for purposes of identification of these mosquitoes. The larvae of two species (Anopheles galvaoi and Anopheles shannoni) are described for the first time.

Gynecologic Nursing. By Robert James Crossen, A.B., M.D., F.A.C.S., Assistant Professor of Clinical Gynecology and Obstetrics, Washington University School of Medicine, St. Louis, Mo., and Frances W. Hoffert, R.N., B.S. Third edition. Cloth. Price, $2.50. Pp. 256, with 194 illustrations. St. Louis: C. V. Mosby Company, 1946.

The third edition of this popular gynecologic textbook for nurses follows the popular plan of co-authorship by a physician and a nurse. This is the best approach to the successful teaching of the medical specialties to nurses. The senior author is the co-author of several popular textbooks on gynecology and brings to this nursing textbook the benefit of his wide experience. It is easy to read and extensively illustrated. In its general plan the book follows the Curriculum Guide prepared by the National League for Nursing Education. Part I presents a survey of the basic knowledge of anatomy and physiology of the reproductive organs. Part II concerns itself with the various gynecologic diseases as well as the common diagnostic procedures. Nursing procedures are emphasized. Review questions and a short bibliography accompany each chapter. This edition should retain the popularity of previous editions.

A Short Practice of Surgery. By Hamilton Bailey, F.R.C.S., F.I.C.S., Surgeon, Royal Northern Hospital, London, and R. J. McNeill Love, M.S., F.R.C.S., F.I.C.S., Surgeon, Royal Northern Hospital, London. Seventh edition. Cloth. Price, 40s. Pp. 1,097, with 1,063 illustrations. London: H. K. Lewis & Co., Ltd., 1946.

The title is perhaps misleading. This is a volume containing over a thousand pages and over a thousand illustrations. It is a complete textbook of surgery from which has been deleted much of the superfluous and ancient material contained in other textbooks. It is concise, is clearly written and makes excellent reading material. The paper, binding and typography are very good, particularly in view of its production in a country ravaged by war for so many years. The seventh edition has been enlarged and brought up to date and contains much very new material. A new chapter on the larynx has been included. The illustrations, almost one fifth of which are colored, are excellent and help greatly in making the text more readable and understandable. The index is inclusive (fifty-one pages). The small glossary giving the old terminology of anatomic names should be helpful to many readers. Another interesting feature is the inclusion of brief biographic footnotes. Lack of bibliography is really the one thing that makes this volume a "short" practice rather than an excellent textbook.

Autopsy—Diagnosis and Technic. By Otto Saphir, M.D., Pathologist, Michael Reese Hospital, Chicago. Foreword by Ludvig Hektoen, M.D. Second edition. Fabrikoid. Price, $5. Pp. 405, with 69 illustrations. New York & London: Paul B. Hoeber, Inc., 1946.

This edition, like the first of 1939, furnishes medical and graduate students in pathology concise yet clear descriptions of procedures in the performance of the necropsy and the common gross changes that may be seen. The illustrations cover technic and anatomic relations important in the observation and removal of normal and pathologic structures. Eighteen different tables are designed to classify and differentiate by distinctive characteristics the common lesions in the important organs. In this edition the discussion on diseases of the breast and the changes in stillbirths and newborn infants are extended. Brief chapters are added on examinations of the nose and sinuses and on anatomic changes in vitamin deficiencies and certain tropical diseases. Like many new books and revised editions the changing findings of the patient and appearances of viscera at the necropsy due to chemotherapy or antibiotics are not mentioned or described. However, the book is an excellent aid and a reliable, quick reference work for the student who finds the ordinary textbook on pathology inadequate in the description of the necropsy.

Proceedings: Conference on Diagnosis in Sterility Sponsored by the National Committee on Maternal Health, January 26-27, 1945, New York City. Edited by Earl T. Engle. Fabrikoid. Price, $5. Pp. 237, with illustrations. Springfield, Illinois: Charles C Thomas, 1946.

This small volume presents a copy of the Proceedings of the Conference on Problems of Human Fertility held under the auspices of the National Committee on Maternal Health in January 1945. Papers in the first group are devoted to an evaluation of gonadal functions in the male by a study of the semen and testicular biopsies. The role of the accessory glands in fertility in the male is discussed by Huggins. Papers in the second group concern themselves with diagnostic methods for evaluating fertility in the female. Endometrial biopsies, basal body temperatures, methods of studying tubal patency and the cervical mucus as a factor in sterility are discussed. Each of these papers is presented by a well known authority in his special field. A general discussion by the members of the conference is included. Treatment of sterility was not considered at this meeting. These conferences, sponsored by the National Committee on Maternal Health, on problems of fertility provide an excellent means for an interchange of ideas by the many workers in this special field.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

IMMUNIZATION OF BABY FOR TRIP TO JAPAN

To the Editor:—Advice is sought by the wife of an army officer on the advisability of taking a baby to Japan. What dosage of yellow fever, cholera and other immunizations should be given a 6 months old baby?

M.D., Alabama.

ANSWER.—Taking a healthy 6 months old baby to Japan would seem permissible if the father can assure himself in advance that suitable sanitary living accommodations are available. Taking younger babies at this time is wisely being discouraged by the army medical authorities. Yellow fever immunization is not necessary unless the child is to be taken through one of the yellow fever areas of South America or Africa as delineated officially by UNRRA under the International Sanitary Conventions. Neither Japan nor any place traversed by travel across the Pacific is in such an area. The dosage of yellow fever vaccine of standard type (17 D) for an infant is the same as for an adult, as the material is a living, modified virus. Administration can be arranged at several centers through the United States Public Health Service. Smallpox vaccination of infants going to the Orient is definitely necessary and is required. It is also recommended that infants be given diphtheria toxoid. Cholera and plague vaccinations are not insisted on or recommended for young infants.

HAZARDS OF PHOTOENGRAVING

To the Editor:—A photoengraver has had a morning cough over a period of years which at times causes him to vomit. Repeated roentgenograms of the chest have been negative and there does not seem to be any reason for this cough. Some time ago he passed a bloody stool, and a gastric series revealed a duodenal ulcer. After prolonged ulcer management the ulcer has healed, but the patient continues to cough. With what fumes would he come in contact with in photoengraving? Would these fumes affect his general health?

Leo B. Sedlacek, M.D., Cedar Rapids, Iowa.

ANSWER.—The trade of photoengraving has become so complex and so many processes and different substances are utilized that it is necessary to learn from the patient what chemicals are used by him. Long ago Hayhurst recorded that "photoengravers as a class are probably exposed to the greatest number of poisonous substances to be found in any single industrial calling." Earlier statistical records indicate a high frequency of respiratory disorders. Among other materials likely to be involved are mineral and organic acids, ammonium and bromium compounds, aniline, benzene, naphtha, chromium compounds, alkalis, chlorinated compounds including chloroform, cyanides, sulfides, formaldehyde, glues, gums, albumin and varnishes. The most likely single offender seems to be nitric acid or nitric oxides. In addition to possible direct respiratory tract irritation, some of the agents mentioned are sensitizers.

PENICILLIN FOR DIABETIC FURUNCULOSIS

To the Editor:—What is the present status of the use of penicillin, orally or parenterally, in the treatment of diabetic furunculosis?

Samuel S. Schept, M.D., Union City, N. J.

ANSWER.—The use of penicillin parenterally for the treatment of furunculosis in patients with diabetes has been highly satisfactory. In addition to penicillin, restrictions of diet and extreme care of the skin are important features. Most of the treatment that has been carried forward has been with the use of parenteral penicillin. If oral penicillin is used, at least three to five times as much will be needed.

USE OF OXYGEN FOR PENICILLIN AEROSOL

To the Editor:—A number of articles on the administration of penicillin vapor or aerosol penicillin have suggested the use of oxygen. Is oxygen necessary or would compressed air serve as well?

Charles E. Atkinson, M.D., Banning, Calif.

ANSWER.—Oxygen is used to aerosolize the penicillin. It is not necessary to use oxygen for this purpose, and air under comparable pressure can be used for the same purpose.

PENICILLIN FOR ERYTHREMIA

To the Editor:—Is penicillin effective in the treatment of erythremia? A white man aged 67 was treated several years ago for hypertension and cerebral hemorrhage. For the past six months he has complained of weakness, easy fatigue, headache, vertigo, dyspnea, sweating, partially dulled mental powers and a general run down condition. The blood pressure was 180/100, and the spleen and liver were not palpable. A diagnosis of erythremia was made on the basis of the symptoms and the finding of hemoglobin 115 Gm. per hundred cubic centimeters Sahli, red blood cells 6,500,000, white blood cells 16,000 and a normal differential with no abnormal cells. The patient was given intramuscular penicillin injections of 200,000 units once daily for eight days. One week after the completion of this treatment the patient reported that he felt much improved and the blood count fell to red blood cells 5,060,000, white blood cells 12,000 and hemoglobin 100 Gm. per hundred cubic centimeters.

Nicholas A. Mandelos, M.D., Washington, D. C.

ANSWER.—In the 13,000 cases reported to the Committee on Chemotherapeutics and other Agents, National Research Council, and the Committee on Medical Research of the Office of Scientific Research and Development concerning the use of penicillin in various disorders, none with erythremia were treated with penicillin. It will, of course, be necessary to follow the patient referred to in the query for a much longer time to determine whether or not the decrease in the red blood cell count and hemoglobin are permanent.

FINGER INFECTIONS IN EGG POWDERING PLANT

To the Editor:—During the last four years a number of people in this city have developed infections of the fingers, the cause of which has not been determined. An egg powdering plant is located here. Several people working in the plant have acquired severe infections which eventually have required amputation.

L. L. Roberts, D.V.M., Chanute, Kan.

ANSWER.—The files of the Office of Dermatology of the U. S. Public Health Service do not contain records of infections similar to those described in the query among workers engaged in powdering eggs.

To determine the actual cause of these infections, studies of the occupational process should be made, including bacteriologic studies of the products in the various stages of the process, and correlation of these results with the occupation of the workers affected and the organisms causing the infection. In Occupational Diseases of the Skin by Schwartz and Tulipan there is a chapter on methods of investigation of occupational diseases of the skin.

An effective method of prevention before the actual cause is discovered consists in wearing rubber gloves, impervious sleeves and aprons, and frequent washing of the hands with soap and water followed by dipping the hands in a mild antiseptic solution.

SODIUM TETRATHIONATE FOR ACUTE THROMBOANGIITIS OBLITERANS AND MIGRATING PHLEBITIS

To the Editor:—In the June 29, 1946 issue of The Journal the use of sodium tetrathionate in the treatment of superficial migrating phlebitis is mentioned. Please discuss dosage, mode of administration and action and give references.

S. Davidson, M.D., Boynton Beach, Fla.

ANSWER.—Sodium tetrathionate has been advocated by Theis and Freeland (Thromboangiitis Obliterans: Treatment with Sodium Tetrathionate and Sodium Thiosulfate, *Arch. Surg.* **40**:190 [Feb.] 1940) particularly in acute cases of thromboangiitis obliterans. They found an increase in skin temperatures, a decrease in pulse rate and increase in the oxygen carrying power of the blood; it counteracted the effect of smoking on the vascular system. They have also used this drug—which has a more delayed but also more prolonged action than sodium thiosulfate—in the treatment of arteriosclerosis, Raynaud's phenomena and other forms of vascular disease. It is quite possible that this strong reducing agent does affect the clotting mechanisms; de Takats (*Surgery* **14**:661 [Nov.] 1943) showed that it increased the patient's response to heparin. Others (Allen, Barker and Hines: Peripheral Vascular Diseases, Philadelphia and London, W. B. Saunders Company, 1946) have questioned the value of the drug.

Clinically, in the acute exacerbations of migrating phlebitis or thromboangiitis obliterans daily injections of sodium tetrathionate maintained for ten to fourteen days seem to alleviate the symptoms and bring on a remission faster than it spontaneously occurs. It does not cure the disease but acts somewhat like foreign protein therapy, though without chills, fever and other complications. Occasionally a patient may become dizzy or nauseated, and once in a great while a sensitization reaction may occur. The drug contains 44 per cent organic sulfur; it comes in ampules containing 0.6 Gm. in the form of a dry powder, which is dissolved in 10 cc. of sterile distilled water and slowly injected intravenously. One injection may be given

twice a day in hospitalized and once a day in ambulatory patients for ten to fourteen days. If this is effective, injections can be continued for another two weeks. It is a good preparatory measure for patients in the active stage of thromboangiitis obliterans before sympathectomy is undertaken.

MAMMARY HYPERTROPHY IN INFANTS

To the Editor:—A girl aged 6 months has had enlarged breasts since birth. In the past few months the breasts have grown more rapidly to their present size of hickory nuts. They are firm to palpation and do not appear to be simply fat tissue. Vulvar enlargement and colostrum secretion are absent. Because of allergic eczema the infant was given goat's milk, which relieved the eczema immediately. Apparently the acceleration of breast growth began with the use of the goat's milk formula. Is there evidence that goat's milk contains an estrogenic substance in quantities sufficient to produce this effect? Should an ovarian tumor be suspected?

M.D., New York.

ANSWER.—As far as known there is not any relationship between the ingestion of goat's milk or of any animal milk to the mammary enlargement noted in the infant described in the query.

In the neonatal period mammary hyperplasia with some secretion is common in breast fed infants. This is most commonly encountered during the second week of life and may continue as late as the third month. This infantile mammary secretion, when examined, has been found to be chemically similar to human colostrum. It is said to be due to two hormones which are transmitted to the fetus through the placenta, namely estrogen from the ovary, which produces the breast hypertrophy, and prolactin from the mother's pituitary, which causes the colostrum-like secretion. Both of these endocrine substances have been demonstrated in the urine of infants during the first few days of life. This neonatal mammary hypertrophy and secretion of "witch's milk" have been noted equally in male and female infants.

Precocious mammary development may be caused by pituitary, adrenal, ovarian, renal and pineal hyperplasia or tumors. Endocrine therapy may also be a cause; however, the excessive breast development from such causes is accompanied by early appearance of pubic and maxillary hair and genital overdevelopment. As hirsuties and abnormal sexual development are stated to be absent in the infant under question, it seems unlikely that a tumor would be the cause of the breast enlargement. It might be well to analyze the urine of this infant for an increased amount of estrogenic substances. Further, as the enlargement is bilateral, it is improbable that a local growth is present. Well fed, well developed normal infants often exhibit bilateral enlargement of the breast area.

PROGRESSIVE MUSCULAR DYSTROPHY

To the Editor:—A woman in her early fifties on the faculty of one of the country's large universities has suffered for many years from progressive muscular dystrophy. This was first noticed years ago in her arms. However, during the past few years she has been progressively losing the use of her legs. It is now difficult for her to rise from a chair, and, when standing, her legs are unsteady. She has been on large doses of brewers' yeast and 100 mg. of thiamine hydrochloride daily, together with 15 Gm. of aminoacetic acid. In spite of this her condition is becoming gradually more severe.

M.D., New York.

ANSWER.—A specific form of treatment has not been devised for progressive muscular dystrophy. Recently the effect of vitamin E has been estimated by a considerable number of observers. In general the results obtained by using vitamin E in the form of alpha tocopherol, or the synthetic product d, l-alpha tocopherol acetate, have not been good. A few reports, following the use of large doses, have been slightly encouraging.

Shank and his colleagues used aminoacetic acid, vitamin E and pyridoxine in the treatment of 40 patients with progressive muscular dystrophy at the hospital of the Rockefeller Institute for Medical Research. All forms of treatment proved to be singularly ineffective. In the cases studied the amount of creatinine excreted daily remained remarkably constant, but there was a definite decrease in the amount. On the other hand, the quantity of creatine excreted was much more variable and in most cases was notably increased. They found, as others have done, that testosterone caused retention and storage of creatine but produced no significant change in excretion of creatinine.

Hoagland and others made a more detailed study of 6 boys with progressive muscular dystrophy from the Rockefeller Institute group and compared the findings with 5 normal boys. They concluded that the diminished excretion of creatinine in dystrophy was a more specific phenomenon because of its constancy than excessive excretion of creatine. Many other diseases and even physiologic states in normal human beings lead to an excessive output of creatine. The decrease in creatinine therefore is the most important test of activity of the disease in cases of progressive muscular dystrophy. Patients were given prolonged courses of gonadotropic and thyrotropic principles of the hypophysis and desoxycorticosterone acetate without any change being noted in the clinical state. In 1 case, however, there was improvement following the administration of testosterone propionate, this being the hormone known to cause retention of creatine.

Milhorat and Bartels in observing 15 patients with muscular dystrophy of a progressive type thought that the muscular changes closely resembled the dystrophy induced in animals by deprivation of tocopherol. In animals, when tocopherol is given orally, the creatinuria is promptly reduced and muscle function is restored. When the same vitamin is given parenterally to animals, no effect takes place. This observation led Milhorat and Bartels to suggest that some change takes place in tocopherol in the gastrointestinal tract. The authors believe that tocopherol forms a condensation product with some other substance and that this substance is inositol. When these two drugs were combined, effects were observed on the creatinuria in patients with muscular dystrophy and they suggested that the drug be given further trial.

References:

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MEDICATION BEFORE TONSILLECTOMY

To the Editor:—There is a difference of opinion among doctors as to whether or not patients should have premedication before anesthesia for tonsillectomy. What is the consensus on this matter?

F. L. Schade, M.D., Worthington, Minn.

ANSWER.—There is generally a difference of opinion among surgeons as to the desirability for premedication before tonsillectomy, both in adults and in children.

Most surgeons stanchly advocate premedication because of the four main functions of all premedications: (1) psychic depression or hypnosis, (2) heightening of the pain threshold, (3) reduction of reflex irritability and metabolism and (4) counteraction of undesirable side action of the anesthetic agent.

Those who oppose the use of premedication base their arguments mainly on the belief that its use favors the occurrence of postoperative complications. They feel that the depression of the cough reflex and the thickening of bronchial secretions favor the development of pulmonary complications and, further, in the presence of a diminished cough reflex there is increased likelihood of the aspiration of vomitus and blood. In addition, they contend that, in the presence of prolonged postoperative narcosis induced by premedications, postoperative bleeding may not be promptly discovered.

These objections are invalid if the premedication is properly used. This means individualization of dosage and, as important, that the medicine be given at the proper time preoperatively. If so given, its peak effectiveness is during operation, thus affording the maximum benefit, while its effects rapidly subside postoperatively, causing a minimum of undesirable after-effects.

It is generally agreed that premedication should be employed in tonsillectomy.

IMMUNE SERUM GLOBULIN FOR ORCHITIS OF MUMPS

To the Editor:—Is immune serum globulin of value in the prevention of orchitis in mumps in young adults?

James I. Knott, M.D., San Diego, Calif.

ANSWER.—It is extremely doubtful whether immune serum globulin would be of any benefit for the purpose suggested.

Human convalescent mumps serum has been used for the treatment of mumps and its complications as well as for prevention. However, it is questionable if there is a true specific serum which is of value for preventing or treating mumps orchitis.

TREATMENT OF SPASTIC PARALYSIS

To the Editor:—Are there any recent developments in the treatment of spasticity in children?

Winifred Ingersoll, M.D., Laramie, Wyo.

ANSWER.—Recently there have been reports of improvements in some patients with spastic paralysis with the use of neostigmine and curare. Such treatment should be carried out, however, under the supervision of a neurologist.